

CATAWBA

COUNTY

Catalog
and Bulletin no. II
1962-1963

# CATAWBA COUNTY INDUSTRIAL EDUCATION CENTER

Newton

North Carolina

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# CATAWBA COUNTY INDUSTRIAL EDUCATION CENTER

#### Administration

#### County Board of Education:

Locke Lowrance, Chairman

HOWARD T. CAMPBELL

A. C. HENDERSON, Vice-Chairman

FRED H. LYTTON

ROBERT L. BOGGS

WADE H. LEFLER, Attorney

HARRY M. ARNDT, Superintendent

#### **Industrial Education Center**

Director	Robert	E. PAAP
Associate Director	Marcus B.	SIMPSON
Assistant Director	BRUCE E	B. Bishop

#### **ACADEMIC CALENDAR, 1962-63**

#### FALL QUARTER, 1962

August 23 & 24—Registration for new students and returning students.

August 27—Classes begin for all day students.

September 3—Classes will begin in upgrading, updating and other special classes.

September 9—Last day for registration (late students)

September 10—Last day for registration for updating, upgrading and special classes.

November 19—End of Fall Quarter.

#### WINTER QUARTER, 1962

November 15 & 16—Registration for Winter Quarter.

November 20—Classes begin.

November 23—Last registration date for Winter Quarter.

November 22 & 23—Thanksgiving holidays.

December 23 to January 2—Christmas holidays.

February 22—End of Winter Quarter.

#### SPRING QUARTER, 1963

February 21 & 22—Registration for Spring Quarter.

February 25—Classes begin.

February 28—Registration classes for Spring Quarter. Easter holidays (Good Friday and Easter Monday).

May 21—End of Spring Quarter.

#### **SUMMER QUARTER, 1963**

May 20 & 21—Registration for Summer Quarter.

May 22—Summer Quarter classes begin.

May 27—Last day for registration.

July 1 to July 5—Fourth of July holiday (School will be closed).

August 16—End of Summer Quarter.

It is understood that if the schedule is interrupted by inclement weather, holidays may be affected. Furthermore, the scheduled holidays and the calendar may be changed pending upon policy in the operation of the school.

#### GENERAL INFORMATION

#### **HISTORY**

The Catawba County Industrial Education Center was established through the united efforts of the citizens of Catawba County, members of the Catawba County Board of Education, County Commissioners, civic leaders, members of the Hickory Board of Education, members of the Newton-Conover Board of Education, civic organizations, chambers of commerce, N. C. State Department of Public Instruction, Vocational Education Department, and Division of Trade and Industrial Education.

The desire for an Industrial Education Training Center of this nature was conceived by civic minded leaders early in the year 1958. This dream of the people became a reality by establishing a county wide steering committee for formulating the tentative plans and selecting a site for the I. E. C.

A survey was conducted through Catawba County to determine if a need existed for such a school and if the need warranted the establishment of an I. E. C.

The results of the survey indicated a strong need for the establishing of such an I. E. C., and a progressive plan of procedure was adopted.

Actual preliminary grading and construction began December, 1959 with the completion of the building in August, 1960. The building dedication was held on October 17, 1960 with the presence of Honorable Governor Luther Hodges, Doctor Dallas Herring, Chairman of the State Board of Education, and members of the Department of Conservation and Development, and State Board of Education, plus other State officials.

The physical structure of the I. E. C. is such that the building is constructed in an L-shape. One wing houses the administration offices and classrooms. The other wing provides the shop and laboratory areas. Laboratories and classroom facilities were designed to give spacious accommodations, and are well lighted and ventilated. Each laboratory is equipped with new modern equipment selected specifically for the purpose of training the craftsmen and technicians needed in our industrial area. Classrooms have been provided with new contemporary furniture that also makes the educational program conducive as well as flexible for use. Due to the foresight, efforts and determination of the Catawba county citizens, the I. E. C. became a reality; and the first classes began on September 28, 1960.

#### **PURPOSE**

Catawba County Industrial Education Center is dedicated to the pursuit of inquiry into technical and trade education and to the training of students in understanding and participating in such inquiry.

The major objective of the I. E. C. is to provide an opportunity for students to obtain the highest level of technical, trade and upgrading training possible, and at the same time broaden the student's knowledge of related subjects, which is a prerequisite to specialization in an area of their choice.

#### TYPES OF PROGRAMS OFFERED AT THE I. E. C.

The I. E. C. offers training on four seperate levels to accommodate the educational requirements of the area. The following explanation will describe the various levels.

#### TYPE A — High School Trade Preparatory Program:

This program is open to high school students who desire preparation toward future employment. Students may enter in a preparatory curriculum of their choice, provided they meet the minimum I. E. C. requirements. Students will be expected to attend one or two nine month terms depending on the curriculum they pursue. Provisions will be made whereby students may attend the summer quarter, if they desire.

Students pursuing the high school preparatory curriculum will be expected to attend an additional two quarters to qualify for the post high school trade preparatory certificate.

#### TYPE B — Adult Trade and Preparatory Program:

This program is designed for post high school students, who have reached a great degree of maturity and understanding. Students may enter a curriculum of their choice provided they meet the educational and aptitude requirements in the area of their choice. Students entering into one of the curricula offered in the Type B program will pursue curricula that are more advanced both technically and theoretically, and are required to attend school on twelve months basis until the program has been completed.

#### TYPE C — Technology Program:

The I. E. C. offers three technical curricula: electronics, drafting and design, and air conditioning and refrigeration. Students choosing to

enter these programs must meet educational and aptitude requirements for the area of their choice. Technical programs require individuals who have reached adult maturity; have a well founded educational background, and possess aptitude for this advanced type of training. The technical program requires a curriculum much more advanced than the regular trade program curriculum in that a technician's skills and knowledge generally lie between the skilled craftsman and the engineer. The technical curricula are longer in duration than the trade preparatory programs and put less emphasis on manual manipulation skills, and more emphasis on the technical and theoretical aspects of the various technologies. It is recommended that students who desire to pursue one of the three technical areas attend the 6-hour full time program.

#### TYPE D — Upgrading, Updating, Extension and Supervisory:

One of the various facets of industrial or technical training lies in the area of upgrading, updating, extension and supervisory education. Special courses of instruction can be established whereby people who are already employed and desire to keep abreast of the latest equipment and technical procedures will have an opportunity to obtain this type of knowledge. The I. E. C. participates in a wide variety of courses to fulfill the area needs in this type of training. Courses of this nature can be established in many different fields to meet the needs of the people of the area.

#### ADMISSION PROCEDURE

#### IN SCHOOL YOUTH

The records of the students desiring to enroll at the I. E. C. each year will be screened by the school principal and guidance counselor in order to identify students interested in pursuing one of the various I. E. C. curricula.

These students will be contacted by the I. E. C. counselor, who will explain the program and the potential possibilities that they might expect.

Students who meet the minimum requirements for a selected course and who have the school principal's recommendation should complete the application form and arrange their school schedule so as to include the three hour period needed for attendance at the I. E. C.

Each student must possess the academic background conducive to the program of his selection, and possess a genuine interest for the program of his choice. This aptitude will be determined by the General Aptitude Test Battery (GATB) administered by North Carolina Employment Security Commission. Additional selected tests may be used with the permission of the director.

Application forms and transcripts will be reviewed by the I. E. C. counselor. Prior to the organization of each class, students who are selected will be notified by mail with a copy of the notification to the school principal when to report to the center.

Students who are interested in a two year program, either trade or technical in nature, will be selected from the rising junior class each spring.

Students interested in the one year program such as bricklaying, upholstering, or knitting machine fixing will be selected only from the rising seniors each spring.

## Minimum entrance requirements for technical courses for in school youth:

Student must be 16 years of age by September 1 of his junior year of high school.

Have satisfactorily completed his high school requirements through the 10th grade for admission into the 11th grade.

He should have completed at least two of the following courses in mathematics prior to enrollment at the Center:

Algebra I Algebra II Plane Geometry Solid Geometry Trigonometry

He may be admitted if only one is completed. However, preference will be given to those students who have met the requirements. He must plan to complete the other courses during the balance of his high school career.

Arrangements must be made to enroll in physics or chemistry during his junior and senior year.

#### Minimum entrance requirements for trade courses:

Student must be 16 years of age, and have satisfactorily completed all requirements for entrance into the 11th grade.

Students should have completed some basic mathematics course other

than general mathematics.

Student should show aptitude for course selected.

It is desirable that students entering into a trade preparatory course pursue advanced mathematics and mechanical drawing during the balance of their high school career.

#### Admission Procedure for General Students:

Post high school youth and adults will follow the following admission procedure:

Those who are interested in pursuing one of the curricula of the I.E.C. should make formal application to the I.E.C. administration office, and place a \$2 deposit with their application. A referral slip will be given each applicant whereby he can receive their General Aptitude test at the North Carolina Employment Security Commission for admittance. Other selected tests may be used with the permission of the director.

High School transcripts should be forwarded to the counselor of the I. E. C., and this will be the responsibility of the student. Upon receiving this data and a personal interview with the I. E. C. counselor, a selection will be made.

Students who are selected will be notified by letter of their admission and of the date for registration. Applications for six hour pre-employment courses must be in by August 1 of current year.

#### REGISTRATION AND FEES:

- \$ 2.00 Registration for all students.
  - 1.00 Re-entry fee for students dropped or absent 3 or more days in succession.
  - 3.00 Out-of-county fee per month for course loads over six hours per week.
  - 30.00 Fee for 6 hour (full time) students per quarter.
    - 1.50 Per credit hour for less than full time students.

      (Credit hour is determined by number or hours taken per week).
  - 3.00 Out-of-county fee per quarter for course loads under 6 hours per week.

#### POLICIES

#### **ACADEMIC REGULATIONS:**

Students may enroll in any of the programs offered by the I. E. C. provided they meet proper requirements.

Students may not register for more than one program at any given time.

Regular prompt attendance to all classes is compulsory.

Tardiness is excusable only in the case of emergency, and the right to determine an emergency is reserved by the director. Students should be in class prior to the last bell for all opening periods.

Students may be excused from classes under the following conditions:

Emergency Absence: Emergency absence shall be defined as absence due to — death in immediate family; illness or injury to the student and verified by an excuse from a reputable medical doctor or dentist stating that he has treated the student and recommends that he does not attend classes. The student must present all excuses in writing to the I. E. C. counselor before re-entry to classes.

Excessive Absences: Students are expected to attend classes according to their pre-arranged schedule. Students will be permitted no more than one day of unauthorized leave per month. More than one day will subject the student to lowered grades, automatic failure, or dismissal from the school.

All the time lost by absences must be made up before credit is given for a course.

A student who withdraws from training due to hardship, illness, or shift change, may re-enter providing: (1) the student was in good standing at the time of withdrawal from a program; (2) had notified the I.E.C. counselor in advance of withdrawal; (3) provided scheduling will permit.

Any student who has been dismissed for disciplinary reasons may re-enter after a duration of one year on a probationary basis.

#### **EVALUATION:**

The I. E. C. will accept work and give credit for work done in any accredited school offering a similar course. Students will be required to file records of previous training or transcript of previous work for evaluation with the I. E. C. counselor. A minimum of one half program

residence is required for receiving credit toward a program completion. Student evaluation will be made each six weeks. If the student's work is unsatisfactory, he will be called in for counseling for the purpose of determining why staisfactory work is not being done. The student may be granted a six week probationary period. If progress is not evident, the student will be dismissed from training.

Any student desiring to change his program of study should first discuss the change with his instructor; then with the I. E. C. counselor.

The grading system shall be as follows:

A - Excellent - 90 - 100

B - Good - 80 - 89

C — Average — 70 — 79

D — Failure

I — Incomplete

WP — Indicates withdrawal passing

WF — Indicates withdrawal failing

Grades will be issued at the end of each quarter

#### **GRADUATION:**

The Catawba County I. E. C. will award a state diploma to students who have completed the requirements for a technical curriculum. These requirements are a state examination and a complete review of the students work by the staff or faculty advisory committee of the I. E. C. Students enrolled in trade curricula will be awarded a certificate of completion upon successfully completing a program, and upon the recommendation of the faculty advisory committee.

Upon request, each graduating student may have one transcript indicating courses and grades without cost. Additional transcript may be obtained on request for a fee of \$1.00.

#### **TECHNICAL**

Air-Conditioning and Refrigeration Technology — 1440 hrs.

Drafting Design and Technology — 1440 hrs.

Electronics Technology — 2160 hrs.

CURRICULUM

#### TRADE PREPARATORY

Air-Conditioning-Refrigeration	— 1440 hrs.
Auto Mechanics	— 1440 hrs.
Bricklaying	— 540 hrs.
Cutting (Furniture Fabric)	— 320 hrs.
Drafting	— 1080 hrs.
Knitting Machine Fixing	— 720 hrs.
Machine Shop	— 1440 hrs.
Radio — T.V.	— 1440 hrs.
Sewing (Furniture)	— 320 hrs.
Upholstery	— 520 hrs.

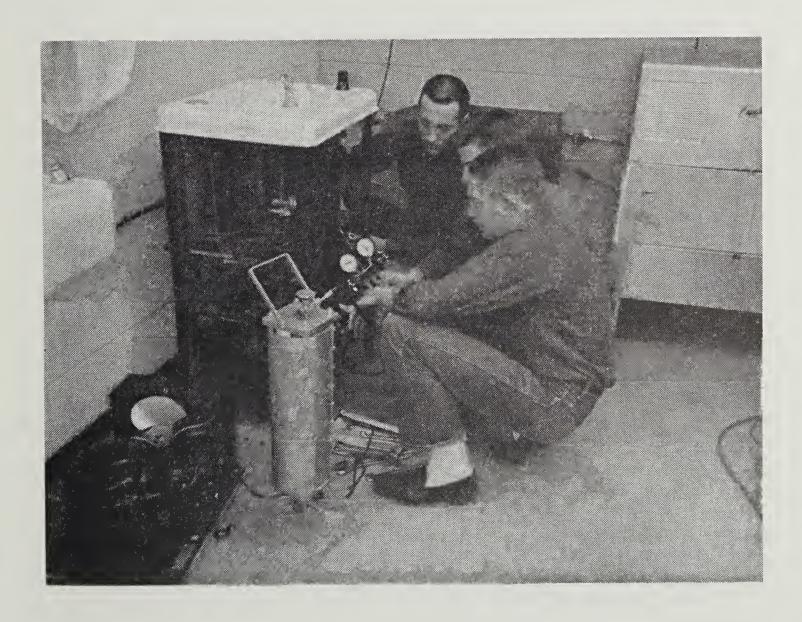
#### AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

This course follows the same outline as the Trade Preparatory course, but the emphasis is on the technician level with as little emphasis on the trade level as is practical.

This is a two year course designed to help the student become proficient and skilled in the installation, maintenance and repair of equipment used in refrigeration plants and air conditioning systems in homes and industry.

Training is given in the use and care of tools and equipment for inspection and testing. The student will study the various kinds of refrigerants, heat flow and heat calculations, and air comfort standards, cooling methods, and heating methods.

This course is arranged in such a manner that one wishing to take it six hours per day may finish it in one year.



#### AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

C — Class Hours	L Labo	rtory Hours Cr. — Cre	edit Hours
First Quarter	C—L—Cr.	Fifth Quarter	C—L—Cr.
ACR 510 Elements of Refrigera ACR 513B Fundamentals of Drav and Blueprint Reading ACR 515C Basic Electricity TOTAL	wing 3—0—3 2—0—2	ACR 550 Elements of Sheet Metal.  ACR 559D Sales and Communication  ACR 550A Calculations and Heat  Loss  TOTAL	on2—0—2 3—0—3
Second Quarter	C—L—Cr.	Sixth Quarter	C-L-Cr.
ACR 520 Domestic Refrigeration ACR 525C Applied Electricity ACR 523A Applied Drafting TOTAL	3—0—3	ACR 560 Duct and Fitting Fabrication  ACR 563A Applied Drafting  ACR 560B Automatic Controls  TOTAL	3—0—3 2—0—2
Third Quarter	C—L—Cr.	Seventh Quarter	C—L—Cr.
ACR 530 Installation and Servi Commercial Refrigeratio ACR 530A Calculations and Hea for Commercial Refrigerat ACR 535A Applied Science	n4—6—6 atloads ion2—0—23—0—3	ACR 570 Oil Burner Installation and Service	2—0—2 3—0—3
Fourth Quarter	C—L—Cr.	Eighth Quarter	C—L—Cr.
ACR 540 Installation and servic Cooling Conditioning Sys ACR 540A Principals of Air Conditioning	tems .1—9—4 2—0—2 ger ng3—0—3	ACR 580 Gas, Burners, Electric He ing Elements and Liquid Heat Applications	4—6—6 2—0—2 s3—0—3
TOTAL		TOTAL	9-0-11

#### DRAFTING DESIGN AND TECHNOLOGY

This is a two year course. In the first section of this course, the major emphasis is on giving students a thorough understanding of the fundamental principals of drafting; use and care of drafting equipment, measurements, lettering problem solving with descriptive geometry, three dimensional visualization and sketching, projections, detailing, drawing reproduction, translation of ideas into drawings based on the A.S.A. standards, and general drafting practices.

The second section explores the various fields of specialized drafting and moves into more advanced areas of specialization which the student has chosen or is inclined to pursue. Included in the program are advanced drafting, elementary perspective projection and basic rendering techniques.

The courses are arranged in a sequence that gives the student technological and special courses as they are needed to correlate their laboratory experience.

#### DRAFTING DESIGN AND TECHNOLOGY

C — Class Hours	L —Laboratory Hours		Cr. — Credit Hours	
		Third Quarter	C—L—Cr.	
First Quarter  DDT 510 Technical Drafting  DDT 511 Related Math  DDT 514 Machine Shop  DDT 512 Technical Writing I	3—0—3	DDT 530 Technical Draft DDT 531 Related Math DDT 535B Physics I DDT 532 Technical Repo	1—0—1 2—0—2	
TOTAL	9—6-11	Fourth Quarter	C—L—Cr.	
Second Quarter	C—L—Cr.	DDT 540 Technical Draf DDT 545B Physics II DDT 542 Technical Repo	2—0—2	
DDT 520 Technical Drafting DDT 521 Related Math DDT 524 Machine Shop	3—0—3	TOTAL	9—6-11	
DDT 522 Technical Writing II		Fifth Quarter	C—L—Cr.	
TOTAL		DDT 550 Technical Draf DDT 559B Business Orga		
		TOTAL	6—9—9	

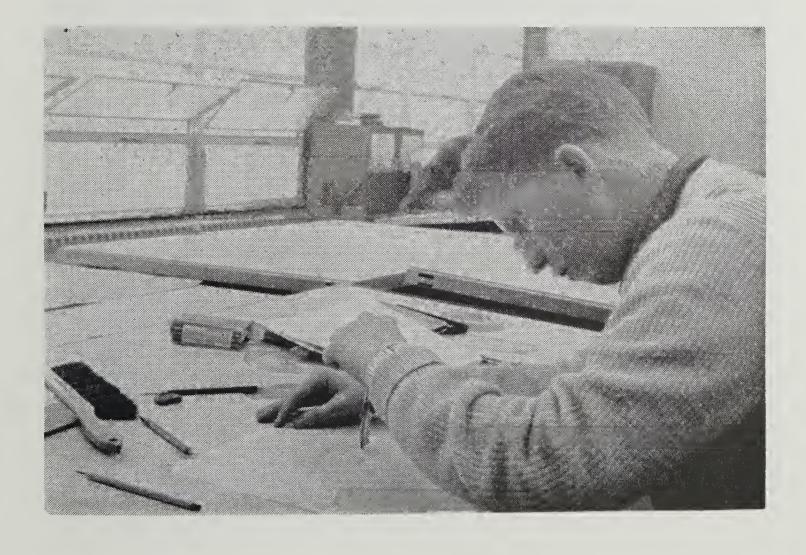
## DRAFTING DESIGN AND TECHNOLOGY (Architectural)

C — Class Hours	L —Labora	atory Hours	Cr. — Cred	lit Hours
Sixth Quarter	C—L—Cr.			
DDTA 560 Technical Drafting	6—6—8			
DDTA 561 Related Math	3—0—3			
	•			
TOTAL	9—6-11	Eighth Quarter		C—L—Cr
		DDTA 580 Technical	Drafting	5—9—8
		DDTA 589A Business	Relations	1—0—1
Seventh Quarter	C-L-Cr.	TOTAL		6—9—9
DDTA 570 Technical Drafting	6—6—8			
DDTA 571 Related Math	2—0—2			
DDTA 572T Technical Specificat	tions 1—0—1			
TOTAT	9-6-11			



## DRAFTING DESIGN AND TECHNOLOGY (Furniture)

C — Class Hours	L —Laborat	ory Hours	Cr. — Credit Hours
Sixth Quarter	C—L—Cr.		
DDTF 560 Technical Drafting  DDTF 564 Related Shop			
TOTAL	6—9—9	Eighth Quarter	C—L—Cr.
			Drafting5—9—8
Seventh Quarter	C—L—Cr.	DDTF 589A Business	Relations1—0—1
DDTF 570 Technical Drafting	6—6—8	TOTAL	6—9—9
DDTF 574 Related Shop	2—0—2		
DDTF 572T Technical Specifications	1—0—1		
TOTAL	9—6-11		



#### DRAFTING DESIGN AND TECHNOLOGY

#### (Machine)

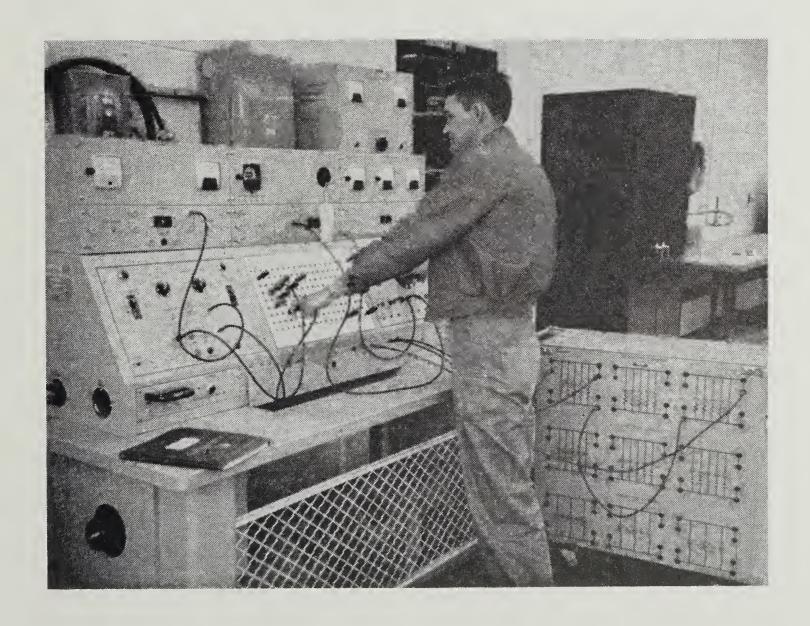
C — Class Hours	L —Labora	tory Hours	Cr. — Credit Hours
Sixth Quarter	C—L—Cr.		
DDTM 560 Technical Drafting			
DDTM 561 Related Math	3—0—3		
DDTM 564 Related Shop (Include Heat Treatment	2-0-2		
TOTAL	9—6-11	Eighth Quarter	C—L—Cr.
		DDTM 580 Technical I	Orafting 5—9—8
		DDTM 589A Business l	Relations1—0—1
Seventh Quarter	C—L—Cr.		-
		TOTAL	6—9—9
DDTM 570 Technical Drafting	4—6—6		
DDTM 571 Related Math	2—0—2		
DDTM 574 Related Shop	2—0—2		
DDTM 572T Technical Specifications	1—0—1		
TOTAL	9—6-11		

#### **ELECTRONICS TECHNOLOGY**

This three year post high school course is arranged to provide technical instruction with emphasis throughout on an understanding of engineering principles basic to the field of electronics technology.

The student will study the various phases of electricity, vacuum tubes, transistors, circuits, and micro waves in step by step procedure. The student will receive related studies in math, drawing, report writing, physics, and social science, and problems will be worked out in the lab in a workable sequence suitable to his instructional needs.

The course is arranged in such manner that one wishing to take it six hours per day may complete it in eighteen months.



#### **ELECTRONICS TECHNOLOGY**

C — Class Hours	L —Laborat	tory Hours	Cr. — Credit Hours
First Quarter	C-L-Cr.	Seventh Quarter	C—L—Cr.
ET 511 Math I	3—0—3	ET 570 Basic Electronics	II2—3—3
ET 510 Basic Electricity (DC)	3—3—4	ET 570A Circuit Analysis	
ET 519C Social Science		ET 570B Transistor Appl	
ET 512 Communication Skills		ET 570C Special Circuit and Analysis	Design
ET 514 Shop Procedures	2—0—2	and Analysis	3—3—4
TOTAL	12—3-13	TOTAL	9—6-11
Second Quarter	C—L—Cr.		
TOTH FOI MEALL T	2 0 2	Eighth Quarter	C—L—Cr.
ET 521 Math I ET 520 Basic Electricity (DC)		ET 580 Basic Electronics	II 1—3—2
ET 529H Social Science		ET 580A Circuit Analysis	
ET 522 Communication Skills		ET 580B Transistor Appl	
ET 524 Shop Procedures		ET 580C Special Circuit and Analysis	Design 4—3—5
TOTAL	12—3-13	TOTAL	9—6-11
Third Quarter	C—L—Cr.		
ET 531 Math II	3—0—3	Ninth Quarter	C—L—Cr.
ET 530 Basic Electricity (AC)		ET 590 U.H.F. and Micro	owaves 3—3—4
ET 533A Technical Drawing		ET 591 Math III	
ET 532 Technical Report Writing	1—0—1	ET 590A Transmission of	R.F.
TOTAL	96-11	Energy	R.F. 4—3—5
		TOTAL	9—6-11
Fourth Quarter	C—L—Cr.		
ET 541 Math II	2—0—2		
ET 540 Basic Electricity (AC)		Tenth Quarter	C—L—Cr.
ET 543A Technical Drawing		ET 600 U.H.F. and Micro	owaves 4—3—5
ET 542 Technical Report Writing	101	ET 601 Math III	
TOTAL	9—6-11	ET 600A Transmission of Energy	f R.F3—3—4
		TOTAL	9—6-11
Fifth Quarter	C-L-Cr.		
ET 550 Basic Electronics I	2-0-2		
ET 543C Graphical Analysis		Eleventh Quarter	CLCr.
ET 555C Physics (Mechanics)			
ET 550A Industrial Electronics	4—3—5	ET 610 Research Report.	
TOTAL	12—3-13	ET 610B Option	······································
		TOTAL	15
First Quarter	C—L—Cr.		
ET 560 Basic Electronics I		Twelfth Quarter	C-L-Cr:
ET 563C Graphical Analysis			
ET 565C Physics (Mechanics) ET 560A Industrial Electronics		ET 620 Research Report. ET 620B Option	
TOTAL	9—6-11	TOTAL	15

### AIR CONDITIONING AND REFRIGERATION Trade Preparatory

The Air Conditioning and Refrigeration trade program is designed to give the student both theoretical knowledge and practical experience in the domestic and commercial fields.

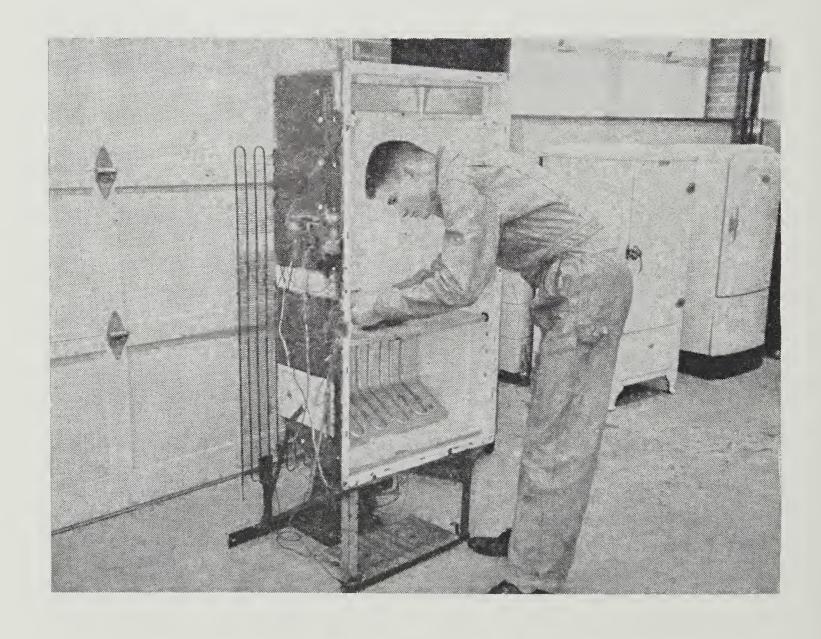
The domestic area includes basic theory, use of tools, gauges, and testing equipment used to service refrigeration and air conditioning units. Actual experience is provided on domestic freezers and refrigerators in the laboratory.

In the commercial area, theory, trouble shooting and installation of reach-in and walk-in units are provided to equip the student for diagnosis and correction of service failure. Included is a study of the uses of air conditioning and refrigeration, temperature and humidity control, air circulation, cleaning and delivery, heat flow and heat calculations, and air comfort standards.

Related instruction is provided in mathematics, bluprint reading, basic science, and technical report writing to broaden the student's theoretical background and provide greater on-the-job proficiency.

C — Class Hours	L —Labora	tory Hours	Cr. — Credit Hours
First Quarter	C—L—Cr.	Third Quarter	C—L—Cr.
ACR 110 Elements of Refrigeration  ACR 113B Fundamentals of Drawin  and Blueprint Reading  ACR 115C Basic Electricity	ng 3—0—3 2—0—2	ACR 130A Calculations for Commercial 1 ACR 135A Applied Scie	rigeration4—6—6 and Heatloads Refrig 2—0—2
		Fourth Quarter	C—L—Cr.
Second Quarter	C-L-Cr.	ACR 140 Installation and Cooling Condition	d Service of ling Systems 1—9—4
ACR 120 Domestic Refrigeration ACR 125C Applied Electricity		ACR 140A Principles of ditioning	Air Con-
ACR 123A Applied Drafting		ACR 140B Estimating fo	r Refrigera- t Cooling 3—0—3
TOTAL	9—6-11	TOTAL	6—9—9

Fifth Quarter	C—L—Cr.	Seventh Quarter	C—L—Cr.
ACR 150 Elements of Sheet M ACR 159D Sales and Commun ACR 150A Calculations and I Loss	ication 2—0—2 Heat3—0—3	ACR 170 Oil Burner Installation and Service	3—0—3
		TOTAL	96-11
		Eighth Quarter	C—L—Cr.
Sixth Quarter	C—L—Cr.	ACR 180 Gas Burners, Electric Hea	eat
ACR 160 Duct and Fitting Fab		Applications	4—6—4
ACR 163A Applied Drafting		ACR 180A Estimating for Heating Systems	2—0—2
ACR 160B Automatic Control	s2—0—2	ACR 189C Management Procedure	s3—0—3





## AUTOMOTIVE MECHANICS Trade preparatory

This is a two year course. Instruction is given in the fundamentals and principles for the maintenance and service of passenger cars. Shop and related class instruction will give the student a good opportunity to become familiar with overhauling engines, transmissions, rear ends, starters, generators, distributors, carburetors, fuel pumps, and other assembly and accessory units.

C — Class Hours	L —Labora	atory Hours	Cr. — Credit Hours
First Quarter	C—L—Cr.	Second Quarter	C—L—Cr.
AM 110 Shop Practice	6—3—7	AM 120 The Power Un	nit3—6—5
AM 111 Mathematics	2—0—2	AM 121 Mathematics	2—0—2
AM 114 Machine Shop	2—0—2	AM 124 Machine Shop	2-0-2
AM 115B Physics	2—0—2	AM 125B Physics	2—0—2
	<del></del>		-
TOTAL	12—3-13	TOTAL	9—6-11

Third Quarter	C—L—Cr.	Sixth Quarter	C—L—Cr.
AM 130 The Electrical System	3—6—5	AM 160 Automatic Transmissions	5—6—7
AM 131 Mathematics	2—0—2	AM 165C Electricity	1-0-1
AM 134 Machine Shop	2—0—2	AM 162 Report Writing	1—0—1
AM 135B Physics	2—0—2	AM 163 Blueprint Reading	2—0—2
TOTAL	9-6-11	TOTAL	9-6-11
		Seventh Quarter	C-L-Cr.
Fourth Quarter	C—L—Cr.	AM 170 The Running Systems	3—6—5
AM 140 The Fuel System	3_6_5	AM 175C Electricity	
AM 141 Mathematics		AM 172 Report Writing	
AM 144 Machine Shop		AM 173 Blueprint Reading	
AM 145B Physics		AM 179B Human Relations	
TOTAL	9—6-11	TOTAL	9—6-11
		Eighth Quarter	C—L—Cr.
Fifth Quarter	C-L-Cr.	AM 180 The Suspension & Steer- ing System	365
AM 150 The Power Train	567	AM 185C Electricity	
AM 155C Electricity		AM 182 Report Writing	
AM 152 Report Writing		AM 183 Blueprint Reading	
AM 153 Blueprint Reading		AM 189B Human Relations	
TOTAL	9-6-11	TOTAL	9-6-11



## BRICKLAYING Trade preparatory

The total length of the course is 540 hours. It is designed to give the student a comprehensive knowledge of the Bricklaying trade. The student will get the related mathematics and blueprint reading which will enable him to do the job.

The laboratory work will enable the student to apply his knowledge in developing the skills of the trade.

C — Class Hours	L —Laboratory Hours		Cr. — Credit Hours
First Quarter	C-L-Cr.		
BRK 110 Bricklaying	6—6—8		
BRK 111 Math	2—0—2		
BRK 113B Blueprint Reading	1—0—1	Third Quarter	C—L—Cr.
TOTAL	9—6-11	BRK 130 Bricklaying	4—6—6
		BRK 131 Math	2—0—2
Second Quarter	C-L-Cr.	BRK 133B Blueprint Rea	ading3—0—3
BRK 120 Bricklaying	5—6—7	TOTAL	9-6-11
BRK 121 Math	2—0—2		
BRK 123B Blueprint Reading	2—0—2		
TOTAL	9—6-11		





#### **CUTTING** (Furniture Fabrics)

This course covering 320 hours offers the student an opportunity to become familiar with the different types of fabrics, how to cut fabrics to the best advantage so that fabric can be saved where possible, and how to correctly measure frames and make patterns. This course is set up to give a lot of practical experience while taking the course. Each student will learn:

- 1. Cutting with shears
- 2. Drawing patterns on upholstery materials from pre-drawn patterns
- 3. Arranging cloth in layers on cutting table in order to cut several patterns in one operation
- 4. Working with bare frames
  - a. Taking measurements for pieces to be cut
  - b. Short cuts for saving material
  - c. Arranging pieces on paper so as to save as much material as possible
- 5. After material is cut
  - a. Why we mark pieces
  - b. Where to mark pieces to guide sewers
  - c. Understanding how much allowance to be figured for seams that are to be sewn
  - d. How to fold cut unit for sewer
- 6. How to cut striped and figured materials to match and how much material to allow for matching
- 7. How to cut loose cushions

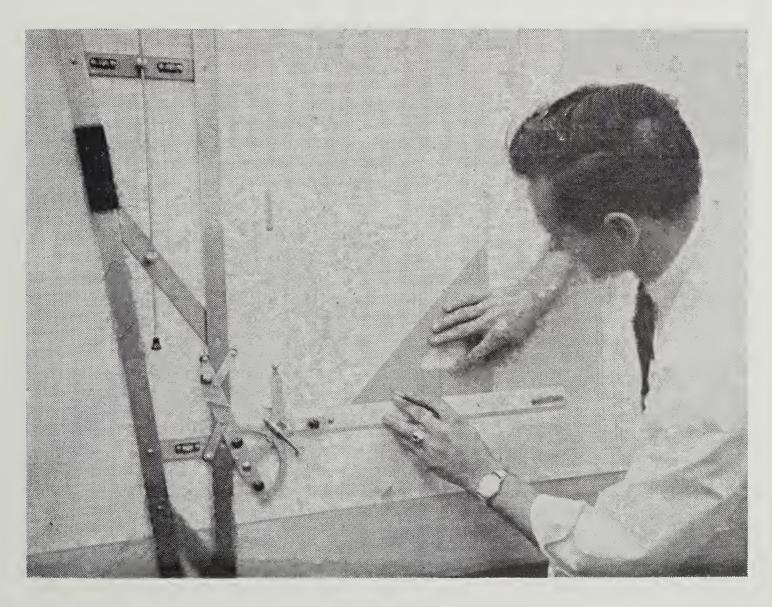


## DRAFTING Trade preparatory

This is a two year course. In the first section of this course, the major emphasis is on giving students a thorough understanding of the fundamental principles of drafting; use and care of drafting equipment, measurements, lettering problem solving with descriptive geometry, three dimensional visualization and sketching, projections, detailing, drawing reproduction, translation of ideas into drawings based on the A.S.A. standards, and general drafting practices.

The second section explores the various fields of specialized drafting, and moves into more advanced areas of specialization which the student has chosen or is inclined to pursue. Included in the program are advanced drafting, elementary perspective projection and basic rendering techniques.

The courses are arranged in a sequence that give the student technological and special courses as they are needed to correlate their laboratory experience.



#### **DRAFTING**

C — Class Hours	L —Laboratory Hours		Cr. — Credit Hours	
First Quarter	C—L—Cr.	Fourth Quarter	C—L—Cr.	
D 110 Drafting	3—6—5	D 140 Drafting	6—6—8	
D 111 Related Math	3—0—3	D 145B Physics II	2—0—2	
D 114 Machine Shop	1—0—1	D 142 Reports	1—0—1	
D 112 Writing I	2—0—2	TOTAL	9—6-11	
TOTAL	9—6-11			
Second Quarter	C—L—Cr.	Fifth Quarter	C—L—Cr.	
D 120 Drafting	3—6—5	D 150 Drafting	5—9—8	
D 121 Related Math		D 150B Business Organ	nization1—0—1	
D 124 Machine Shop	1—0—1			
D 122 Writing II	2—0—2	TOTAL	6—9—9	
TOTAL	9—6-11			
		Sixth Quarter	C—L—Cr.	
Third Quarter	C—L—Cr.	D 160 Drafting Analysi	s6—9—9	
D 130 Drafting	4—6—6			
D 131 Related Math	1—0—1	TOTAL	6—9—9	
D 135B Physics I	2—0—2			
D 132 Reports	2—0—2			
	· · · · · · · · · · · · · · · · · · ·			

TOTAL ...... 9—6-11

## KNITTING MACHINE FIXING Trade preparatory

This one year course of study is designed to give the student a comprehensive knowledge of the knitter fixing trade. The student will master the basic skills of machine fixing on different types of machines and tools and repair operations. Listed below are some of the main points of instruction:

Mill Relationship Mill Safety Stitch Formation Machines Make Up Top Body Heel Feet Ring Toe and Toe Looper Line and Clip Replacement of Parts and Attachments, Purpose Identify Parts Driving Mechanism Main Drum Stripper Drum Dismantling and putting together of machines Trouble Shooting Fundamentals of Pattern Making



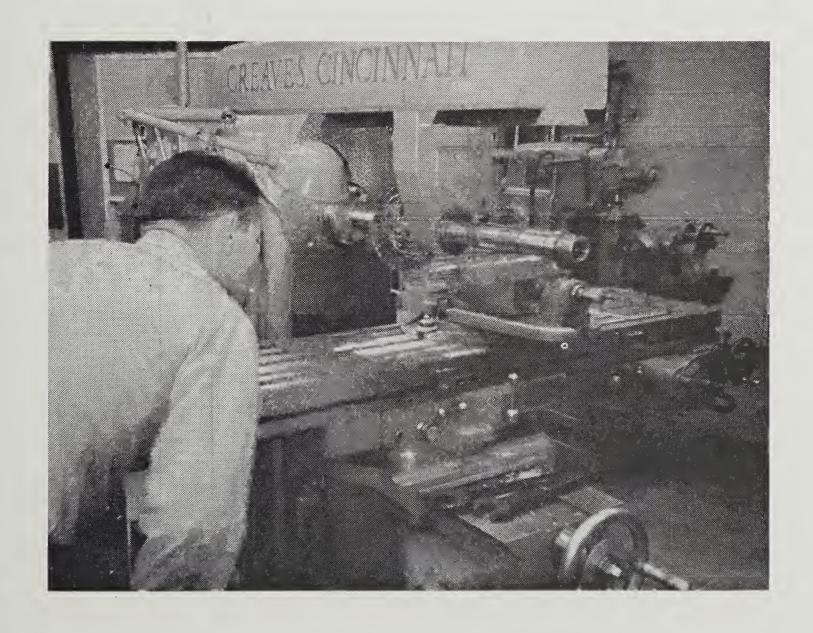
#### MACHINE SHOP

#### Trade preparatory

Students completing the two-year program will learn to carry through to completion the construction and repair of metal parts, tools, and machines. They will have an understanding of blueprint reading and the interpretation of written specifications. They will learn to use all machinist's hand tools including scrapers, chisels, files, precision measuring and layout instruments. They will learn the fundamental setup and operation of all machine tools including lathes, milling machines, shapers grinders, drill presses, and also specialized machines that have been developed from these machine tools. They will posses knowledge of shop mathematics, use of charts and tables, efficient planning of shop work, dimensions, and uses of standard bolts, screws, threads, and tapers. They will be familiar with the working properties of such metals as aluminum, brass, cast and wrought iron and various steels. They should be capable of shaping metal parts to precise dimensions within the close tolerances prescribed.

C — Class Hours	L —Labora	tory Hours Cr. — Cre	edit Hours
First Quarter	C—L—Cr.	Third Quarter	C—L—Cr.
MS 110 Machine Shop Theory and Practice	5—3—6	MS 130 Machine Shop Theory & Practice	5—3—6
MS 111 Applied Mathematics	3—0—3	MS 131 Applied Mathematics	3—0—3
MS 113 Blueprint Reading & Sketching	2—0—2	MS 133 Blueprint Reading & Sketching	2—0—2
MS 115B Applied Science	2—0—2	MS 135B Applied Science	2—0—2
TOTAL	12—3-13	TOTAL	12—3-13
Second Quarter	C—L—Cr.		
are rooms in the file		Fourth Quarter	C-L-Cr
MS 120 Machine Shop Theory & Practice		MS 140 Machine Shop Theory & Practice	3—6—5
MS 123 Blueprint Reading &		MS 141 Applied Mathematics	4—0—4
Sketching	2—0—2	MS 143 Blueprint Reading &	
MS 125B Applied Science	2—0—2	Sketching	2—0—2
*			
TOTAL	12—3-13	TOTAL	9—6-11

Fifth Quarter	C—L—Cr.		
MS 150 Machine Shop Theory & Practice	3—6—5	Seventh Quarter	C—L—Cr.
MS 155D Structure of Metals		MS 170 Machine Shop Theory & Practice	69-9
MS 152B Industrial Communi- cations	3—0—3	TOTAL	6—9—9
TOTAL	96-11		
		Eighth Quarter	C-L-Cr.
Sixth Quarter	C-L-Cr.	MS 180 Machine Shop Theory & Practice	1—9—4
MS 160 Machine Shop Theory &	4 0 0	MS 189E Specifications	2—0—2
Practice		MS 189C Industrial Organization & Management	3—0—3
MS 169B Human Relations	2—0—2		
		TOTAL	6—9—9



## RADIO AND TELEVISION REPAIR Trade preparatory

This is a two year course designed to give classroom and laboratory instruction in basic radio and television servicing including basic radio servicing, basic television servicing and advanced television servicing. Related subjects will cover mathematics, drafting, blueprint reading, business management and human relations.

There is a sufficient amount of theory and practical experience to prepare the student for this type of work. The student learns the use of all types of test equipment used in trouble-shooting techniques, as well as in basic operations.

C — Class Hours	L —Labor	atory Hours Cr. — C	redit Hours
First Quarter	C—L—Cr.	Fifth Quarter	C—L—Cr.
RTV 110 Basic Electronics		RTV 150 Basic Television RTV 153A Electrical Drafting	
TOTAL	9—6-11	TOTAL	9—6-11
Second Quarter	C—L—Cr.	Sixth Quarter	C—L—Cr.
RTV 120 Basic Electronics and Elements of Radio Servicin	g9—6-11	RTV 160 Basic TelevisionRTV 169 Business Management	
TOTAL	9—6-11	TOTAL	9—6-11
Third Quarter	C-L-Cr.	Seventh Quarter	C—L—Cr.
RTV 130 Elements of Radio Servicing		RTV 170 Advanced Television RTV 179B Human Relations	
TOTAL	9—6-11	TOTAL	9—6-11
Fourth Quarter	C-L-Cr.	Eighth Quarter	C-L-Cr.
RTV 140 Hi Fi & Inter Coms	9—6-11	RTV 180 Circuit Design	6—9—9
TOTAL	9—6-11	TOTAL	6—9—9

#### **SEWING** (Furniture Fabric)

In this course the student has an opportunity to learn to operate the sewing machine; to sew material in order to have proper fitting of patterns and to match fabrics. The purpose is to learn the fundamentals of sewing operations, so that speed and production may be attained. The length of the course is 320 hours.

The student will learn the following:

- 1. Basic knowledge of sewing machine
  - a. How to thread machine
  - b. How and when to change stitches
  - c. How to change needles
  - d. How and when to adjust tension
- 2. Understanding pieces to be sewn
  - a. Understanding cutters marks
    - b. Where and why to sew pulls
    - c. Where and why to sew welts
    - d. How to sew welts
    - e. How to French seam (top stitch)
    - f. How to match stripes
    - g. Where to match stripes
- 3. Sewing the loose cushion
  - a. Learning the importance of exact seaming
  - b. How to apply boxing to face of cushion to sew
  - c. How to join boxing
  - d. How to match stripes on boxing and face
  - e. How to finish cushion
- 4. Sewing skirts Flounces
  - a. Learning to sew box-pleat skirt
  - b. Learning to line box-pleat skirt
  - c. Learning to sew flounces



#### **UPHOLSTERY**

This course running 520 hours is set up to give the student an opportunity to learn the skills involved in upholstery. The course covers various styles and types of furniture and gives practical experience in the construction, springing up, and period of history of the frames to be upholstered.

The student will learn to do the following:

- 1. Spit tacks hammer technique
- 2. Arrange and secure filler and padding
  - a. Sewing large stitches across surface of fabric covering of springs and working filler under stitches to form holding base.
  - b. Spreading more filler over surface and placing cover filler, sewing it to bottom fabric.
  - c. Placing additional filler on top of cover and covering padded sections with unbleached muslin, tacking muslin to frame.
  - d. Arranging layer of cotton wadding over muslin cover for smoother finish.
- 3. Cover padded frame with upholstery fabric
  - a. Selecting previously cut fabric, partially stitched, and aligning and smoothing it in place over cotton wadding
  - b. Tacking cover to form in key spots to hold it temporarily.
  - c. Sewing sections of cover which have been left unstitched with invisible lockstitches.
  - d. Strengthing and tacking edges of cover tightly and evenly to frame.
  - e. Untacking covering in places and inserting regulator to smooth out lumpy padding, then permanently tacking.
  - f. Trimming covering around legs and uprights to make a neat fit.

- g. Tacking or gluing gimp over seams to cover rough edges and tack heads.
- h. Sewing or tacking on ornamental braid, buttons, or tassels.
- 4. Making and tying buttons
- 5. History of furniture, periods
- 6. Tools and equipment
- 7. Springing up
- 8. Body Work
- 9. Stuffing
- 10. Covers
- 11. Tufting and buttoning



## COURSE DESCRIPTIONS

#### **KEY**

#### **TECHNOLOGY**

ARC 500 Series — Air Conditioning & Refrigeration

DDT 500 Series — Drafting & Design

ET 500 Series — Electronics

#### TRADE PREPARATORY

ARC 100 Series — Air Conditioning & Refrigeration

AM 100 Series — Auto Mechanics

BRK 100 Series — Bricklaying

D 100 Series — Drafting

MS 100 Series — Machine Shop

RTV 100 Series — Radio & Television

# SUBJECT DESCRIPTIONS

## AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

#### ACR 510 Elements of Refrigeration 4-6-6

This course consist of lectures, discussions, and demonstrations. Not over one-third of the time is utilized in shop practice and experiments. Many fields are covered including essential terminology, laws of refrigeration. physical and chemical effects, materials, and tools. The compression system, compressor construction, refrigerants, controls, absorption systems, and hermetic units are a major portion of the course. Practice will be given in the use of tools in basic refrigeration jobs such as tube bending, flaring, soldering, refrigerant weighing, and other service jobs.

#### ACR 520 Domestic Refrigeration 4-6-6

In this course much time is spent in actual refrigeration service practice. Classroom work and demonstrations occupy approximately one half of the time. Discussions, demonstrations, and practice will take place on residential cabinets using conventional, hermetic, and absorption systems. Cabinet care, controls, system maintenance, and system replacement will be stressed. Typical service problems will be worked out by each student. Complete rebuilding of domestic refrigerators including cabinet refinishing, will be undertaken.

# ACR 530 Installation and Service of Commercial Refrigeration 4-6-6

This course consists of study, demonstration, and practice in the installation and service of commercial refrigeration systems. The various commercial applications of refrigeration are covered in classroom discussions before actual practice is given. The units covered include commercial cabinets, reach-in cabinets, walk-in coolers, display cases, frozen food cabinets, ice cream cabinets, water coolers, ice makers, and other industrial applications. All standard types of compressors, condensers, coils, valves, and controls are studied. Various systems should be installed, and typical service problems worked out.

# ACR 530A Calculations and Heat Loads For Commercial Refrigeration 2-0-2

This course is the basis for system design and contains the theory for service of commercial refrigeration systems. Many topics are studied among which are heat loads, heat leakage, coil and condensing unit capacities, coil types and design, coil usage, coil capacities, cooling loads, refrigerants, latent heat, specific heat, motor sizing, and tubing sizing.

# ACR 540 Installation and Service of Cooling Conditioning Systems 1—9—4

The course will consist of discussions, installations, and service practice on the

various types of air cooled and water cooled conditioning systems. Types of units used will include self contained and remote air cooled residential and small commercial units, water cooled units, water towers, chilled water systems, heat pumps, and automotive systems. Service of air movement systems and installation and service of standard controls are stressed. Service and storage of window units are included.

# ACR 540A Principles of Air Conditioning

2-0-2

In this course the history, theory, and factors affecting air conditioning are studied and discussed. The course will cover history of air conditioning, terminology, temperature measurement, air movement, humidity, psychometric properties, comfort zone, effective temperature, ducts, air diffusion, air cleaning ozone, testing instruments, and heat loads. Information is presented here that can never be gained by ordinary work experience.

# ACR 540B Estimating for Refrigeration and Comfort Cooling 3-0-3

The student will be given pratice in time and material take-offs from job drawing and specification lists. Methods of calculating overhead and other hidden cost are discussed, and the application of these operating expenses to time and material to determine true costs is covered. Estimates are prepared covering true costs with necessary mark-up to insure workable profits for the refrigeration contractor.

#### ACR 550 Elements of Sheet Metal 4-6-6

The student is introduced to the sheet metal shop with its rules and regulations concerning safety and workmanship. He learns to recognize and use safely the various hand tools and machines of the trade. Hand, machine, and fastening operations are correlated with flat layout and parallel line development in the formation of pipe intersection, straight duct, elbows, offsets, and reducers as used in the conditioning trade.

## ACR 550A Calculations and Heat Loss 3-0-3

In this atrde course heat loss through various structures and heat needed to maintain comfort are studied. Practice is given in establishing the heating needs of various structures and in the selection of equipment to meet these needs. Heat distribution, both air and liquid, is studied and systems are designed to accomplish proper distribution. This course should be very closely correlated with the drafting course which comes in the following quarter.

#### ACR 560B Automatic Controls 2-0-2

This section is designed to prepare the student for the study of heating devices. The fundamentals of controls, definitions, fundamentals of measurement, electric controls, pneumatic controls, and controls for domestic heating are covered in theory so they may be applied in the laboratory section.

# ACR 570 Oil Burner Installation and Service

This course involves study and practice in the installation and servicing of equipment using high pressure, low pressure, jet, and vaporizing burners. The installation and service of various oil burning equipment controls are studied. Actual practice is given in "trouble shooting" servicing of oil burners, fans, pumps, and their controls under typical working conditions. Service department stock, tools, and procedure should be an integral part of the instruction.

#### ACR 570B Automatic Controls

This course, a continuation of Automatic Controls, covers zone controls, unit heater and ventilator controls, commercial fan system controls, commercial refrigeration controls, and radiant panel controls.

## ACR 580 Gas Burners, Electric Heating Elements, and Liquid Heat Applications

4-6-6

2 - 0 - 2

The student studies and receives practice in servicing and installing gas burners and electric heating elements and their controls. The applications of various heating devices in liquid heating and their controls are studied. While not a course in steamfitting, the principles of installation of hot water and low pressure steam boilers with their controls, pumps, and coils are covered. The course also includes the actual hookup of a small boiler.

# ACR 580A Estimating for Heating Systems

Time and material take offs of ductwork and distribution systems, actual cost analysis, and profit percentage mark-ups are stressed. Equipment costs and mark-ups for forced air and liquid heat are studied both for new installations, replacements, and repairs to systems. Operational cost estimates are also a part of the course covered.

# DRAFTING DESIGN AND TECHNOLOGY

## **DDT 510 Basic Technical Drafting**

3-6-5

4-6-6

DDT 550 Technical Drafting

tals of specialization.

5-9-8

2-0-2

This course is designed to cover the evolution of the graphic language, theories of projection, use and care of drafting equipment, introduction to drafting procedures, basic constructions, and techniques of lettering.

#### DDT 520 Basic Technical Drafting 3-6-5

In this course the student studies history of measurements, standard procedure for size descriptions, technique of dimensioning, geometric construction, various methods of pictorial sketching, and shape description.

#### DDT 530 Technical Drafting 4-6-6

In this course the student covers orthographic projection, multiview drawing, conventional adaptations, and drawing and sketching.

## DDT 540 Technical Drafting 6-6-8

In this course the area of study will cover theory and practice of sectioning and constructing auxiliary views, revolutions, types of working drawings, various methods of drawing reproduction, and theory and application of axonometric and oblique projection.

# DDTA 560 Advanced Technical Drafting

6-6-8

This course is a study of foundations and footings, building materials, floor plans, elevations and construction details.

This course will include the theory and application of intersections and develop-

ment, perspective drawing, inking, seminar in diversified drafting, and the fundamen-

# DDTA 570 Advanced Technical Drafting

6-6-8

This course includes room planning, the various architectural mechanical considerations, and the making of working drawings.

# DDTA 580 Advanced Technical Drafting

5-9-8

This course includes advanced study of same areas covered in DDTA 560 and DDTA 570. Each student is required to design and detail fully one complete structure.

#### DDTF 560 Advanced Technical Drafting

6-6-8

This course covers materials and furniture layout, detailing, and billing out.

#### DDTF 570 Advanced Technical Drafting

6-6-8

This course is a study of anatomical relationships in construction of furniture, materials, and complete layout and detail drawings.

## DDTF 580 Advanced Technical Drafting

5-9-8

This course covers basic rendering techniques and complete detail drawings of both case goods and upholstered furniture.

## **ELECTRONIC TECHNOLOGY**

#### ET 510 Basic Electricity (DC)

3-3-4

Electron theory, electrical units, Ohm's law, resistance combination, meter connections, magnetism and magnetic circuits, electric power, characteristics of electric conductors, inductance and capacitance, direct current generators, motors, and controls, and use of common measuring and metering equipment are studied.

## ET 520 Basic Electricity (DC)

4-3-5

Prerequisite — ET 510

(Continuation of ET 510 Basic Electricity (DC)

#### ET 530 Basic Electricity (AC)

3-3-4

Characteristics of alternating current waves; analysis of the behavior of alternating current components; phase and power factor; power measurement under balanced and unbalanced conditions in delta and wave connected systems; two-phase and and wye connected systems; two-phase and three-phase systems; application of vector algebra in the analysis of series and parallel combinations of impedances.

# Prerequisite — ET 530

4-3-5

(Continuation of ET 530 Basic Electricity (AC))

#### ET 550 Basic Electronics I

2-0-2

Introduction to the technical concepts of electronic components and circuits; principles and characteristics of vacuum tubes and transistors.

#### 4-3-5 ET 550A Industrial Electronics

In this course the student will study time delay circuits, gas tubes, rectifiers and voltage regulators, photo-electric circuits, resistance welding controls, highfrequency applications, electronic motor controls, and synchros and servomechanisms.

#### DDTM 560 Advanced Technical Drafting

4-6-6

This course is a study of the properties and uses of metals, cams and gears, assembly drawings, and jig and fixture detailing.

#### **DDTM 570 Advanced Technical** Drafting

4-6-6

This is a continuation of jig and fixture detailing, the development of gages, and clamping devices.

#### DDTM 580 Advanced Technical **Drafting**

5-9-8

course includes a study of milling and lathe fixtures, cutting tools, and sheet metal dies.

#### ET 560 Basic Electronics I 0-3-1

Prerequisite — ET 550

(Continuation of ET 550 Basic Electron-

#### ET 560A Industrial Electronics 3-3-4

Prerequisite — ET 550A

(Continuation of ET 550A Industrial Electronics)

#### ET 570 Basic Electronics II 2 - 3 - 3

Principles of operation and application of such basic electronic circuits as tuned circuits, power supplies, detectors, amplifiers, and oscillators; fundamentals of radio receivers, cathode ray oscilloscopes, and basic test devices and measuring instruments.

#### ET 570A Circuit Analysis 2-0-2

In this course the student will study the principles of circuit tracing, and the relationship of different circuits, standard symbols for electronic components, drawing symbols, multi-switch control circuits, key switch circuit design, phone jack and plug circuits, relays, schematic diagram simplification, and equipment layout and sketch-

#### 2-0-2 ET 570B Transistor Application

(This course is being revised)

#### ET 570C Special Electronic Circuit 3-3-4 Design and Analysis

this course the student will study stics, reverberation, control of noise vibration, decibel notation, electroacoustics, acoustic transducers-microphones, lo u dspeakers, magnetic and disc recording, vacuum tube amplifier design, transistor circuit design, transient analysis design, electronic computers, and data storage.

#### ET 580 Basic Electronics II

1-3-2 Prerequisite ET 570

(Continuation of ET 570 Basic Electro-

#### ET 580A Circuit Analysis

3-0-3

Prerequisite ET 570A

(Continuation of ET 570A Circuit Analvsis)

# ET 580B Transistor Application Prerequisite ET 570B

1-0-1

(Continuation of ET 570B Transistor Application)

#### ET 580C Special Circuit Design and Analysis

4-3-5

Prerequisite ET 570C

(Continuation of ET 570C Special Electronic Circuit Design and Analysis)

#### ET 590 Ultra-High Frequencies and Microwaves

3-3-4

This is a study of radar, time base and marker generators, UHF and Microwave generators, transmission lines and waveguides, UHF and microwave antennas; and radar and microwave systems.

#### ET 590A Transmission of R F Energy 4-3-5

In this course the student will study oscillator circuit design, radio frequency power amplifiers, modulation, electro-magnetic waves, and transmission lines and antennas

# ET 600 Ultra- High Frequencies

and Microwaves

4-3-5

Prerequisite ET 590

(Continuation of ET 590 Ultra-High Frequencies and Microwaves)

#### ET 600A Transmission of R. F.

3-3-4

Prerequisite ET 590A

(Continuation of ET 590A Transmission of R. F. Energy)

#### ET 610, ET 620 Research Report and —Each course 15→ Option

The student will select a problem of his choice, subject to the approval of the teacher; do the necessary research, organize his findings, and present this as a term paper to the teacher.

# AIR CONDITIONING AND REFRIGERATION

#### ACR 110 Elements of Refrigeration 4-6-6

This course consists of lectures, discus-This course consists of fectures, discussions, and demonstrations. Not over one-third of the time is utilized in shop practice and experiments. Many fields are covered including essential terminology, laws ered including essential terminology, laws of refrigeration, physical and chemical effects, materials, and tools. The compression system, compressor construction, refrigerants,, controls, absorption systems, and heremetic units are a major portion of the course. Practice will be given in the use of tools in basic refrigeration jobs such as tube bending, flaring, soldering, refrigerant weighing, and other service jobs.

#### **ACR 120 Domestic Refrigeration** 4-6-6

In this course much time is spent in actual refrigeration service practice. Classroom work and demonstrations occupy approximately one half of the time. Discussions, demonstrations, and practice will take place on residential cabinets using conventional, hermetic, and absorption systems. Cabinet care controls systems. tems. Cabinet care, controls, system maintenance, and system replacement will be stressed. Typical service problems wil be worked out by each student. Compete rebuilding of domestic refrigerators, including cabinet refinishing, will be undertaken.

#### ACR 130 Installation and Service of **Commercial Refrigeration** 4-6-6

This course consists of study, demonstration, and practice in the installation and service of commercial refrigeration systems. The various commercial applications of re-

frigeration are covered in classoom discussion before actual practice is given. The units covered include commercial cabinets, reach-in cabinets, walk-in coolers, display cases, frozen food cabinets, ice cream cabinets, water coolers, ice makers, and other industrial applications. All standard types of compressors, condensers, coils, valves, and controls are studied. Various systems valves, should be installed, and typical service problems worked out.

#### ACR 130A Calculations and Heat Loads for Commercial Refrigeration 2-0-2

This course is the basic course for system design and contains the theory for service of commercial refrigeration systems. Many topics are studied among which are heat loads, heat leakage, coil and condensing unit capacities, coil types and design, coil usage, coil capacities, cooling loads, refrigerants, latent heat, specific heat, motor sizing, and tubing sizing.

#### ACR 140 Installation and Service of 1-9-4 Cooling Conditioning Systems

course will consist of discussions, This course will consist of discussions, installations, and service practice on the various types of air cooled and water cooled conditioning systems. Types of units used will include self contained and remote air cooled residential and small commercial units, water cooled units, water towers, chilled water systems, heat pumps, and automotive systems. Service of air movement systems and installation and service of standard controls are stressed. Service and storage of window units are included and storage of window units are included.

# ACR 140A Principals of Air Conditioning

2-0-2

In this course the history, theory, and factors affecting air conditioning are studied and discussed. The course will cover history of air conditioning, terminology, temperature measurement, air movement, humidity, psychometric properties, comfort zone, effective temperature, ducts, air diffusion, air cleaning ozone, testing instruments, and heat loads. Information is presented here that can never be gained by ordinary work experience.

# ACR 140B Estimating for Refrigeration and Comfort Cooling 3-0-3

The student will be given practice in time and material take-offs from job drawing and specification lists. Methods of calculating overhead and other hidden costs are discussed, and the application of these operating expenses to time and material to determine true costs is covered. Estimates are prepared covering true costs with necessary mark-up to insure workable profits for the refrigeration contractor.

#### ACR 150 Elements of Sheet Metal 4-6-6

The student is introduced to the sheet metal shop with its rules and regulations concerning safety and workmanship. He learns to recognize and use safely the various hand tools and machines of the trade. Hand, machine, and fastening operations are correlated with flat layout and parallel line development in the formation of pipe intersection, straight duct, elbows, offsets, and reducers as used in the conditioning trade.

#### ACR 150A Calculations and Heat Loss 3-0-3

In this course heat loss through various structures and heat needed to maintain comfort are studied. Practice is given in establishing the heating needs of various structures and in the selection of equipment to meet these needs. Heat distribution, both air and liquid, is studied and systems are designed to accomplish proper distribution. This course should be very closely correlated with the drafting course which comes in the following quarter.

#### ACR 160 Duct and Fitting Fabrication 4-6-6

The student is given practice in fabrication of duct systems closely correlated with the layout as designed in the drafting section. Instruction and practice are given in radial and triangulation development as used in the fabrication of duct systems and fittings necessary to conditioning systems.

## **AUTOMOTIVE MECHANICS**

#### AM 110 Shop Practice

6-3-7

In this course the student will get an introduction into automotive mechanics, safety in the shop, and proper use of hand tools and power tools, measuring in the automotive shop, fasteners, specification, and fundamentals.

Working conditioning systems will be designed, fabricated, and installed in the shop.

#### ACR 160B Automatic Controls 2-0-2

This section is designed to prepare the student for the study of heating devices. The fundamentals of controls, definitions, fundamentals of measurement, electric controls, pneumatic controls, and controls for domestic heating are covered in theory so they may be applied in the laboratory section.

# ACR 170 Oil Burner Installation and Service

4-6-6

This course involves study and practice in the installation and servicing of equipment using high pressure, low pressure, jet, and vaporizing burners. The installation and service of various oil burning equipment controls is studied. Actual practice is given in "trouble shooting" servicing of oil burners, fans, pumps, and their controls under typical working conditions. Service department stock, tools, and procedure should be an integral part of the instruction.

#### ACR 170B Automatic Controls 2-0-2

This course, a continuation of Automatic Controls, covers zone controls, unit heater and ventilator controls, commercial fan system controls, commercial refrigeration controls, and radiant panel controls.

#### ACR 180 Gas Burners, Electric Heating Elements, and Liquid Heat Applications 4—6—6

The student studies and receives practice in servicing and installing gas burners and electric heating elements and their controls. The applications of various heating devices in liquid heating and their controls are studied. While not a course in steamfitting, the principles of installation of hot water and low pressure steam boilers with their controls, pumps, and coils are covered. The course also includes the actual hookup of a small boiler.

# ACR 180A Estimating for Heating Systems 2-0-2

Time and material take offs of ductwork and distribution systems, actual cost analysis, and profit percentage mark-ups are stressed. Equipment costs and mark-ups for forced air and liquid heat are studied both for new installations, replacements, and repairs to systems. Operational cost estimates are also a part of the course covered.

#### AM 120 Power Unit

3-6-5

This course is designed to acquaint the student with the principles of engine operation, nomenclature of engine parts and their function, engine troubles and repairs, engine testing and rating, bearings and lubrication and the cooling system.

#### AM 130 Electrical System

3-6-5

#### AM 160 Automatic Transmissions

AM 170 Running System

5-6-7

3-6-5

In this course the student will study the voltmeter and ammeter, battery testing and charging, starter testing and repair, generator testing and repair, regulator testing and adjusting, ignition testing and repair, lighting system service, trouble shooting, and type-typ and tune-up.

The student will study gear systems and construction and operation and their controls, hydramatic transmissions and construction and operation, torque converter transmissions, service testing and repair.

#### AM 140 FUEL SYSTEM

3-6-5

In this course the student will study propeller shaft, universal joints and differentials, axels, bearings, brake systems and brake operation, power brakes, trouble shooting, service and repair.

In this course the student will study combustion and engine fuels, the fuel tank, the lines, the filters, fuel pumps, carburetors, air cleaners, fuel system testing, re-pair and rebuilding, super chargers and fuel injection.

#### AM 150 Power Train

5-6-7

The student will become acquainted with clutch and clutch adjustments the and clutch service, trouble shooting, fundamentals of gear operation, gear ratio, selective shift transmissions, servicing overdrives, repair and servicing practices.

#### AM 180 Suspension and Steering System

3-6-5

this course the student will study wheels and tires, front suspension and shock absorbers, steering gears, power steering, and wheel alignment.

chimneys, foundtions, etc., expansion strips, wall ties, calking, cutting limestone, starting

bonds, construction of arches, cavity

## BRICKLAYING

#### BRK 110 Bricklaying

6-6-8

This course is designed to give the student a history of the bricklaying industry. Clay and shell brick, mortar, laying foundations, laying brick to a line, bonding and tools and their uses will be studied in this course. The laboratory work will give the student practical experience in applying the knowledge learned in the classroom.

#### BRK 130 Bricklaying

wall construction, etc.

4-6-6

**BRK 120 Bricklaying** 5-6-7 This course is designed to give the student information and practical application of that information in motar for walls, dows.

This course is designed to give the student study in the practical application of layout and erection of reinforced grouted brick masonry lintels, story pole and batter boards, fireplaces, glazed tile, panels, deco-rative stone, granite, marble, adhesive terra cotta and modular walls with modular win-

#### DRAFTING

#### D 110 Basic Drafting

3-6-5

D 140 Drafting In this course the area of study will cover theory and practice of sectioning and constructiog auxiliary views, revolutions, types of working drawings, various methods of drawing reproduction, and theory and application of avenaged and application of a sectioning and application of avenaged and application of a sectioning and application of a sectioning and a section of a section of

8-6-8

This course is designed to cover the evolution of the graphic language, theories of projection, use and care of drafting equipment, introduction to drafting procedures, basic constructions and techniques of lettering.

#### D 120 Basic Drafting 3-6-5

In this course the student studies history of measurements; standard procedure for size description, technique of dimensioning, geometric construction, various methods of pictorial sketching, and shape description.

#### D 150 Drafting

oblique projection.

5-9-8

This course will include the theory and application of intersections and developapplication of intersections and development, perspective drawing, inking, seminar in deversified drafting, and the fundamentals of specialization.

and application of axonometric and

#### D 130 Drafting

4-6-6

In this course the student covers orthographic projection, multiview drawing, conventional adaptations, and drawing and sketching.

#### D 160 Drafting Analysis

6-9-9

(Course being revised)

## MACHINE SHOP

# MS 110 Machine Shop Theory and Practice

5-3-6

This course is an introduction to the machinist trade and the potential it holds for the craftsman. It will deal primarily with the identification, care and use of basic hand tools, basic layout tools and materials, and an introduction to off-hand grinding procedures, drill press operations, and introduction to lathe processes.

# MS 120 Machine Shop Theory and Practice

5-3-6

An Introduction to precision measuring instruments and layout procedures. Processes will consist of lathe, drill press, grinding (off-hand) and milling machines. These processes will be elementary processes with more emphasis on simple operating procedures.

# MS 130 Machine Shop Theory and Practice

5-3-6

A course in precision layout tools and procedures, powersawing, advanced lathe, drill press, and milling machine operations. In addition, it will cover introductory units in surface grinding and shaper operations. Safety procedures will be stressed at all times.

# MS 140 Machine Shop Theory and Practice

3-6-5

Additional experience will be gained in the machine shop laboratory on the engine lathe, drill press, surface grinder, milling machine, and shaper. Basic operations on the cylindrical grinder will be utilized. Projects wil be completed encompassing all of the operations, tools, and procedures thus far utilized and will be stressed throughout the course.

# MS 150 Machine Shop Theory and Practice

3-6-5

Advanced work on the engine lathe, drill press and boring machines, grinders, milling machine and shaper. Basic gear work and terminology will be introduced. Precision in operations and related information pertaining to these operations will be covered.

# MS 160 Machine Shop Theory and Practice

4-6-6

This course will cover calculation, cutting and measuring of spur, helical, worm gears, and wheels. The trainee will use precision tools and measuring instruments such as vernier height gages, protractors, comparators and et cetera. Continued practice and experience in all machine procsss will be given. Elementary turret lathe and T & C grinder units will be given.

# MS 170 Machine Shop Theory and Practice

4-6-6

This course will consist of the development of class projects utilizing previously learned processes in planning, blue print reading, machine operations, final assembly and inspection. Additional processes on the turret lathe, tool and cutter grinder, cylindrical and surface grinder, advanced milling machine operations, etc.

# MS 180 Machine Shop Theory and Practices

1-9-4

Continuation of the class project introduced in the previous quarter, special procedures, processes and equipment will be covered. Safety procedures and establishing of good work habits and attitudes acceptable to the industry will be stressed during the course.

# RADIO AND TELEVISION REPAIR

## RTV 110 Basic Electricity

6-6-8

This course is designed to serve two primary functions. The first will be to introduce the student to the language of electricity and the second will be to lay a firm foundation of fundamentals before the student is subjected to specific radio and television problem areas. This course is designed with a practical approach that will be useful for technicians and servicemen. The laboratory work will be correlated with the classroom instructions. In the laboratory the student will be taught the proper use and care of hand tools. It will be the basic duty and responsibility of the instructor to teach and practice SAFETY at all times.

#### RTV 120 Basic Electricity and Elements of Radio Servicing 9-6-11

This is a continuation of the basic eleclectricity in the first quarter. In this course the student will study filters, electron tubes, and transistors. Much emphasis will be placed on electron tubes. Typical troubles will be described in each respective area. The necessary related mathematics will be taught as the subject theory demands it, thus combining the mathematics theory into one course of study.

Elements of radio servicing is restricted to the most widely used receiver—the superheterodyne. Basic information will be presented at all times and this information will be organized to develop procedures for application to specific radio troubles. The laboratory time will be correlated with basic electricity and elements of radio servicing. The instructor will assign such theory related projects so as to enhance the student's ability to use proficiently the various instruments of measurement.

#### RTV 130 Elements of Radio Servicing 7-6-9

This is a continuation of the Elements of Radio Servicing from the second quarter. This course is of an advanced nature and will confront the student with advanced problems in radio servicing. This course will include a study of portable receivers, automobile radio, and servicing the AM/FM receiver. This course will conclude with a study of the service bench for good service organization, as well as for appearance. The laboratory time will be correlated with the elements of radio servicing. The instructor will continue to observe and teach SAFETY. Emphasis will be placed on electronic symbols.

#### RTV 140 Hi Fi and Inter. Coms. 9-6-11

The student will study basic, intermediate, and advanced Hi Fi. Practical problems will be worked out, and the use of speakers, public address systems, film recording, and play back and AM/FM radio and TV fidelity standards.

#### RTV 150 Basic Television 6-6-8

This course is designed to follow the course in radio fundamentals. It consists of practical explanations of television principles, receiver circuits and trouble shooting. The necessary applied mathematics will be taught with this course as the theory demands it. First, the principles of television are explained, and from there this course is designed to go into the genral requirements of television receivers. Materials in this course will be restricted to the essentials of black and white television receivers. The laboratory work is directly correlated with the classroom work. Emphasis is placed

on the use and care of tools and instructions in the television repair shop.

#### RTV 160 Basic Television 6-6-8

This is a continuation of the basic television course in the preceding quarter. It will be continuing the study of television principles, television receivers, and problem areas. Specfic units will include practical design of video amplifiers, antennas and transmission lines, and receiver servicing. Laboratory work will be correlated with classroom work. This course is designed speficially for students who wish to establish their own radio and television business.

#### RTV 170 Advanced Television 6-6-8

This course is designed to present the student with advanced work in the elements of television. New servicing techniques will be introduced. A study will be made of the printed circuit, servicing receivers that use them, and problems arising from tube filaments with varying thermal characteristics. The course will be concluded with the study of color television. The laboratory work is directly related to the classroom work. The student will be given a chance to think individually concerning the solution to specific problems. Individual experiments will be encouraged.

#### RTV 180 Circuit Design 6-9-9

(Course being revised)

# RELATED

# COURSE DESCRIPTIONS

#### **AM 111 Mathematics**

2-0-2

This course provides a review of the basic mathematics needed in the automotive mechanics shop. Addition, subtraction, multiplication and division of whole numbers, fractions, both decimal and common, computation of square roots, and use of hte square root table will be covered.

#### AM 121 Mathematics

2-0-2

This course covers problems in weights and measurements needed in the automotive shop. An introduction will be made to solving problems of linear equations in one unknown. The student will also be introduced to ratio and proportion, and formulas of area, and volume of circles and cylinders.

#### AM 131 Mathematics

2-0-2

In this course the student will concentrate on various formulas needed in automotive mechanics, such as: displacement, compression ratio, gear ratio, piston speed, Ohm's law, and problems in transmission and differential.

#### **AM 141 Mathematics**

2-0-2

This course covers problems involving money, wages, taxes, and cost of materials. Problems in the construction of the reading of various types of graphs and curves and geometric constructions will be covered.

#### **BRK 111 Mathematics**

2-0-2

This course is designed to give the student a review in addition, subtraction, multiplication and division of common fractons and decimal fractions and their use in construction work. Percentages, interest and weights and measures will be studied.

#### **BRK 121 Mathematics**

2-0-2

This course is designed to give the stu-

dent knowledge and application of measurements in estimating brick walls, mortar, chimnevs, fireplaces, steps, concrete footings, ect.

#### **BRK 131 Mathematics**

2-0-2

This course is designed to give the student practical application of his mathematical knowledge in estimating concrete walls, concrete floors, concrete stairs, concrete walks, septic tanks, wood lath and lathing, plaster, stucco, rubble stone, adhesive terra cotta and quantities of modular masonry units.

#### D 111 Mathematics

3-0-3

In this course the student will study multiplication and division using the slide rule. Ratio and proportion will be studied and applied to different scales for drawing. The student will be introduced to problems requiring theorems and constructions in plane and solid geometry.

#### D 121 Mathematics

3-0-3

This is a study of squares and square roots, linea requations with one unknown, solving area and volume formula of geometrical rigures.

#### D 131 Mathematics

3-0-3

A study of the solution of right and oblique triangles, and the study of intersections of various solids.

#### DDT 511 Mathematics

3-0-3

In this course the student will apply arithmetic and the fundamental concepts of algebra, addition, subsraction, multiplication and division to drafting. Exact use of the slide rule will be taught. Ratio and proportion will be applied to the different scales for drawing. Problems from plane and solid geometry will be applied to drafting.

#### **DDT 521 Mathematics**

This is a study of squares and square roots, linear equations with one unknown, solving area and volume formula of geo-

metrical figures.

DDT 531 Mathematics 3-0-3

3 - 0 - 3

A study of the solution of right and oblique triangles, and the study of intersections of various solids.

DDTA 561 Mathematics 3-0-3

Applications of mathematics to building design and construction including floor space, cost of materials, strength of materials, heat load and loss, weights, roof loads, and other problems.

DDTA 571 Mathematics 2-0-2

Prerequisite TDA 561 (Continuation of TDA 561 Mathematics)

DDTM 561 Mathematics 3-0-3

Applications of mathematics to machinery, including pulleys, gears, horsepower, efficiency, electricity, and shop machines.

DDTM 571 Mathematics 2-0-2

Prerequisite TDM 561

(Continuation of TDM 561 of Mathematics)

ET 511 Mathematics 3-0-3

Review of arithmetic and the fundamental concepts of algebra, addition, subtraction, multiplication, and division; expression of stated problems in mathematical form; transformation of equations; fractions; factoring; exponents; roots; radicals; and an introduction to second order equations.

ET 521 Mathematics 2-0-2

Prerequisite ET 511

(Continuation of ET 511 Mathematics)

ET 591 Mathematics 2-0-2

(This course is being revised)

ET 601 Mathematics 2-0-2

(This course is being revised)

ET 514 Shap Procedures 2-0-2

This is an introductory course to give the student a knowledge of shop procedures and safety and a familiarity with shop tools, equipment, and materials in the machine shop. The student will study shop details, shop organization, and bench work.

ET 524 Shop Procedures 2-0-2

This course is a continuation of ET 514. The student will study machine shop tools

and equipment and miscellaneous materials such as wire, conduit, insulating materials, wood, wood fibers, hard rubber, and masonite. Emphasis will be on forming and shipping sheet metal, plastics, and heavy metals.

#### MS 111 Applied Mathematics 3-0-3

A unit designed to lay the foundation for a better understanding of applied mathematics. This course begins with simple mathematic situations dealing with fractions, decimals, conversion of one to the other, short methods and checks, percentage and applications, ratio and proportions, power and roots.

## MS 121 Applied Mathematics 3-0-3

This course is an introduction to algebra and algebraic computations. It will introduce the equation and solutions by addition, subtraction, multiplication, division. Special products and quotients, factoring, equations and applications, exponents, powers and roots will also be covered.

#### ME 131 Applied Mathematics 3-0-3

Fundamental laws of geometry with work in the solution and construction of polygons, triangles, circles, prisms, cylinders and various other solids. Emphasis will be placed on the triangle a an introduction to trigonometry.

#### MS 141 Applied Mathematics 4-0-4

Continued work in trignometry with emphasis placed on applications to the machine shop. The use of the trigonometry tables will be stressed giving the trainee sufficient background knowledge to solve practical problems as they arise in the machine shop. Practical applications and problems will furnish the trainee with experience over the wide range of geometric propositions and trignometric relations in actual shop problems.

#### RTV 111 Basic Mathematics 3-0-3

This course is a unit of study designed to review the student in basic mathematics. This course will serve as a foundation on which to build the other related mathematics as the student progresses into advanced electricity. Basic mathematics will begin with a general review of addition, subtraction, multiplication, and division of whole numbres, decimals, and fractions. It will progress to elementary algebra with emphasis placed on symbols, equations, and the concept and use of formulas.

#### AM 152 Report Writing 1-0-1

This course will include a review of sentence and paragraph structure and practices in technical writing, and also use of resource material.

#### AM 162 Report Writing 1-0-1

This course will include writing business letters of the type the mechanic would need to b familiar with, and a complete letter of application.

## AM 172 Report Writing

1-0-1

In this course the student will study the techniques of writing descriptive material relating of machines and parts, and preparing orders for procuring such parts. The student will reach a degree of proficiency in which complete writings will be studied and practiced.

#### AM 182 Report Writing

1-0-1

In this course the student will learn to make reports such as defective material reports and warranty reports which would go through the dealer to the manufacturer, and also descriptions of proposed machine repairs for which the shop might bid. Out of this field each student will select one type of report and write it in the form which industry uses.

#### D 112 Writing I

2-0-2

The aim of this course is the improvement in word use, development of a larger general and technical vocabulary. A study will be made of sentence and paragraph structure and paragraph exercises in writing technical descriptions and explanations related to the chosen specialty of the student.

## D 122 Writing II

2-0-2

A study of the principles of reading, listening for understanding, written development of portions of technical reports, development of skills in letter writing.

#### D 132 Reports

2-0-2

Emphasis will be put on the development of informal and periodic reports, exercises in presenting reports orally, writing manufacturing and construction process manuals.

#### D 142 Reports

1-0-1

In this course each student will choose a specific reporting task and will develop and write a complete formal report which will be his term paper for the course.

#### ET 512 Communication Skills 2-0-2

Exercises in writing, speaking, and listening. Analysis is made of each student's strengths and weaknesses. The pattern of instruction is geared principally to helping students improve skils in areas where common weaknesses are found. Practice is directly related to the student's technical field. The time allotments for the various elements within major divisions will depend upon the background of the class.

#### ET 522 Communion Skills

2-0-2

Prerequisite ET 512 (Continuation of ET 512 Communciation Skills)

#### ET 532 Technical Report Writing 1-0-1

Techniques of collecting and presenting scientific data, informal and formal reports,

special types of technical papers. Forms and procedure for technical reports are studied and a pattern is established for all formal reports to be submitted in this and other courses.

#### ET 542 Technical Report Writing 1-0-1

Prerequiite ET 532

(Continuation of ET 532 Technical Report Writing)

#### D 512 Technical Writing I

2-0-2

The aim of this course is the improvement in word use, and development of a larger general and technical vocabulary. A study will be made of sentence and paragraph structure and paragraph exercises in writing technical descriptions and explanations related to the chosen specialty of the student.

#### TD 522 Technical Writing II

2-0-2

A study of the principles of reading, listening for understanding, written development of portions of technical reports, development of skills in letter writing.

#### **TD 532 Technical Reports**

2-0-2

Emphasis will be put on the development of informal and periodic reports, exercises in presenting reports orally, writing manufacturing and construction process manuals.

## **TD 542 Technical Reports**

1-0-1

In this course each student will choose a specific reporting task and wil ldevelop and write a complete formal report which will be his term paper for the course.

#### ACR 513B Fundamentals of Drawing and Blueprint Reading

3-0-3

This is a course in the elements of drawing, including lines, rules, view of relationship, basic orthographic projection, sections and cutaways as applied to machine assemblies, and basic floor plans and elevations. The course is designed primarily to provide the background information necessary before a study of the drawings and shop sketches of the trade can be undertaken.

# ACR 523A Applied Drafting

2-0-2

A study of the prints of the trade such as machine prints, exploded prints, wiring schematics, floor plans and elevations, conditioning layouts, and equipment layouts constitutes a major portion of this course. Practice in shop sketching, isometric sketching, and equipment layouts on prints or tracings is part of this course. It is expected that each student will become adept at reading them, as well as be able to produce the necessary shop sketches.

## ACR 563A Applied Drafting

3-0-3

A review of floor plans and elevations, both domestic and commercial, is the first item in this course. Tracing of floor plans and copies of portions of plans and elevations are made. Information and plans developed in the course in calculations and heat loss are used in studying and understanding the design of both forced air and liquid systems. Special attention is given to shop sketches of equipment placement and heating distribution systems.

# ACR 113B Fundamentals of Drawing and Blueprint Reading 3-0-3

This is a course in the elements of drawing, including lines, rules, view of relationship, basic orthographic projection, sections and cutaways as applied to machine assemblies, and basic floor plan and elevations. The course is designed primarily to provide the background information necessary before a study of the drawings and shop sketches of the trade can be undertaken.

#### ACR 123A Applied Drafting 2-0-2

A study of the prints of the trade such as machine prints, exploded prints, wiring schematics, floor plans and elevations, conditioning layouts, and equipment layouts constitutes a major portion of this course. Practice in shop sketching, isometric sketching, and equipment layouts on prints or tracings is part of this course. It is expected that each student will become familiar with the prints of the trade and will become adept at reading them, as well as be able to produce the necessary shop sketches.

## ACR 163A Applied Drafting 3-0-3

A review of floor plans and elevations, both domestic and commercial, is the first item in this course. Tracing of floor plans and copies of portions of plans and elevations are made. Information and plans developed in the course in calculations and heat loss are used in studying and understanding the design of both forcd air and liquid systems. Special attention is given to shop sketches of equipment placement and heating distribution systems.

#### AM 153 Blueprint Reading 2-0-2

In this course the student will be introduced to the principles of reading and interpreting blueprints and of making shop sketches of actual maching parts.

## AM 163 Blueprint Reading 2-0-2

In this course the student will read and interpret blueprints involving charts, instruction and service manuals for basic tools, engine, and accessories, front end and clutch, cooling system, fuel system, lubrication system, and engine assembly charts.

#### AM 173 Blueprint Reading 2-0-2

In this course the student will read and interpret blueprints, charts, diagrams and instructions for transmissions, rear ends, chassis lubrication, and electrical systems.

#### AM 183 Blueprint Reading

2-0-2

In this course the student will be given an opportunity to apply the methods of automotive drawing and sketching to late model servicing.

## BRK 113B Blueprint Reading 1-0-1

This course is designed to introduce the student to the reading of blueprints of simple elementary structures.

## BRK 123B Blueprint Reading 2-0-2

The student will study the blueprint of one car frame garage for floor plans, foundation, doors, windows, roofs, sills and construction details, etc.

#### BRK 133B Blueprint Reading 3-0-3

This course is designed to give the student experience in reading more advanced blueprints. Blueprint of a five room house will be studied with emphasis on the plot plan, basement plan, footing, walls, columns, girder joists, doors and window frames, pilasters, chimneys, stairs, plumbing, heating and electricity.

#### ET 533A Technical Drawing 2—3—3

Use of templates, including lettering templates; fundamentals of drawing and drafting room practices; electrical circuit drafting, terms symbols, and standards; construction an dinterpretation of typical industrial drawings.

#### ET 543A Technical Drawing 2-3-3

Prerequisite ET 533A (Continuation of ET 533A Technical Drawing)

#### ET 553C Graphic Analysis 2-0-2

Graphic representation and graphic analysis; layout methods used in pattern and template work; graphs, charts, and plots; an introduction to descriptive geometry and graphic calculus.

#### ET 563C Graphic Analysis 3-0-3

Prerequisite ET 553C (Continuation ET 553C Graphic Analysis)

# MS 113 Blueprint Reading & 2-0-2

A course in the interpretation and reading of blueprints used by industry. It will contain information on the basic principles of the blueprint, lines, views, dimensioning procedures and notes.

# MS 123 Blueprint Reading and Sketching 2-0-2

A continuation of the previous course of blueprint reading with additional work in scaling, dimensions, holes, flllets, radii, title block information and specifications, and bill of materials, alterations and revision, and procedures.

# MS 133 Blueprint Reading and Sketching

2-0-2

Further practice in the interpretation of blueprints as they are used in industry. Prints will be supplied by industries and plans of operations will be made. Free-hand sketching will be introduced as a means of passing on ideas, information and processes.

# MS 143 Blueprint Reading and Sketching

2-0-2

Continuation of free-hand sketching and a dvanced blueprint interpretation. The trainee will also utilize this experience in the machine shop laboratory courses.

#### RTV 133A Electrical Drafting 2-0-2

This course will provide a fundamental understanding of drafting and then relate it to electricity. This course will begin with lettering and progress through one, two, and three view drawing to give the student an understanding of third angle projection. The student will be introduced to drawing instruments and other aids such as the electrical templates.

#### RTV 153 Electrical Drafting 3-0-3

This is the advanced course of drafting procedure. This course will teach schematic drawing of circuits, circuit diagrams, graphs, and charts. The graphs will include layout of sine and cosine functions. This course will be concluded with some work in freehand sketching.

#### AM 114 Machine Shop 2-0-2

In this course the estudent will study fasteners, such as bolts, studs, nuts, cotter pins, lock washers, snap rings, rivets and keys; and hand tools such a sscrew drivers, hammers, also end wrenches, box wrenches, socket wrenches, torque wrenches, Allen wrenches, chisels and punches.

#### AM 124 Machine Shop 2-0-2

The student will become familiar with files, hacksaws, taps, dies, measuring devices, such as feeler gauges, calipers, micrometers, dial indicators and drills.

#### AM 134 Machine Shop 2-0-2

In this course the student will become familiar with, and gain practice in, machines such as grinders, drills and lathes.

## AM 144 Machine Shop 2-0-2

In this course the student will study metals such as cast iron; different types of steel; different kinds of materials; such as, copper, bronze, aluminum; and will continue the study of machines.

#### D 114 Machine Shop 1-O-1

In this course the student will study materials such as cast iron, hot rolled steel, cold rolled steel, tool steel and other metal materials.

#### D 124 Machine Shop

1-0-1

This course is a study of shop machines and what each machine will do, along with study of tools and measuring instruments.

#### DDT 514 Machine Shop

1-0-1

In this course the student will study materials such as cast iron, hot rolled steel, cold rolled steel, tool steel and other metal materials.

#### DDT 524 Machine Shop

1-0-1

This course is a study of shop machines and what each machine will do, along with study of tools and measuring instruments.

#### ACR 515C Basic Electricity

2-0-

This course covers the basic theories of electricity, types of electricity, methods of production, and transmission and transforming of electricity. Such factors as the electron theory, electricity by chemical action, electricity by friction, electricity by magnetism, induction, voltage, amperage, resistance, horsepower, wattage, and transformers are major parts of the course.

#### ACR 525C Applied Eletricity 3-

In applied electricity the information presented in Basic Electricity is applied both in theory and in practice to the installation and service of refrigeration and conditioning systems. Transformers, motors, motor controls, system controls, electric valves, capacitators, wiring diagrams, and electrical code, as it applies, are among the items taken up.

#### ACR 535A Applied Science

3-0-3

An introductory course in physics and its applications in the field of Air Conditioning and Refrigeration. It will cover systems of measurements, properties of liquids, solids and gases, temperatures, basic machines, and friction. Related areas such as oxidation and reduction, reactions, acids, bases and salts will also be studied. Experiments and laboratory exercises will be utilized and integrated with the theory and classroom assignments.

## ACR 115C Basic Electricity

2-0-2

This course covers the basic theories of electricity, types of electricity, methods of production, and transmission and transforming of electricity. Such factors as the electron theory, electricity by chemical action, electricity by firction, electricity by magnetism, induction, voltage, amperage, resistance, horsepower, wattage, and transformers are major parts of the course.

#### ACR 125C Applied Electricity 3-0-3

In applied electricity the information presented in Basic Electricity is applied both in theory and in practice to the installation and service of refrigeration and conditioning systems. Transformers, motors, motor controls, system controls, electric valves, capacitators, wiring diagrams, and electrical code, as it applies, are among the items taken up.

An introductory course in physics and its applications in the field of Air Conditioning and Refrigeration. It wll cover systems of measurements, properties of liquids, solids and gases, temperatures, basic machines, and friction. Related areas such as oxidation and reduction, reactions, acids, bases and salts will also be studied. Experiments and laboratory exercises will be utilized and integrated with the theory and classroom assignments.

#### AM 115B Physics

2-0-2

3-0-3

This course is an introduction to the basic concepts of machines and mechanisms as applied to the auto shop. The student will have an opportunity to visualize problems and perform experiments in basic units of force, balance, motion, levers, inclined plane, wheel and axel, screw thread and gear trains. This study will be continued in AM 125B and AM 135B. Emphasis in this scourse will be on basic forces, definitions, action, and reaction, tension, comparison, comparison, action, and reaction, tension, comparison, comparison, action, and reaction, tension, comparison, comp nitions, action and reaction, tension, compression, parallelgram of forces, rectangular components and concurrent forces.

#### AM 125B Physics

2-0-2

This course is a study of paralled forces, moments, levers, nonconcurrent forces, solution of typical force systems and motion.

#### AM 135B Physics

This course is a study of units of work, power and measurements, strength af materials, fluids, gases, heat elements and

#### AM 145B Physics

2 - 0 - 2

This course is a continuation of the above courses. More emphasis will be put upon laboratory experiments and working out problems that arise in the auto mechanics work. The student will be encouraged to choose his own problem and work it out.

#### D 135B Physics

2-0-2

This course is designed to give the student a thorough knowledge of forces and their effects, parallel and angular forces, mechanical movements, the simple machines, simple and compound gear trains, compound machines, mechanical power and transmission, friction, and lubrication.

#### D 145B Physics

2-0-2

Prerequisite D 135B (Continuation of D 135B Physics)

#### MS 115B Applied Science

2-0-2

This course is an introduction to the basic concepts of machines and mechanisms as applied to the machine shop. The student will have an opportunity to visualize problems and perform experiments in basic units of force balance motion levers in units of force, balance, motion, levers, inclined plane, wheel and axel, screw thread and gear trains. This study will be continued in MS 125B and MS 135B. Emphasis in this course will be on basic forces, definitions, action and reaction, tension, compared to the state of the s pression, parallelogram of forces, rectangular components and concurrent forces.

# MS 125B Applied Science

This course is a study of parallel forces, moments, levers, nonconcurrent forces, solution of typical force systems and motion.

#### MS 135B Applied Science

2-0-2

This course is a study of units of work, power and measurements, strength of materials, fluids, gasses, heat elements and light.

#### MS 165B Heat Treating Methods 3-0-3

A course designed to give the individual a knowledge of treating methods of ferrous and non-ferrous metals. Hardening, tempering and annealing and the effects of these treatments upon structure and physical properties of metals ar studied. Included is a study of the effects of cold and hot working on the properties of ferrous and non-ferrous metals and alloys, heat treatment of special steels, and operation of the gas furnace and its controls.

#### MS 155D Structure of Metals

This course is an elementary and practical approach to metals, their structure, markings, classifications and uses, interpretation and specifications of steels and their properties by the use of manuals, catalogs, charts, and etc.

#### **DDT 535B Physics**

This course is designed to give the student a thorough knowledge of forces and their effects, parallel and angular forces, mechanical movements, the simple machines, simple and compound gear trains, compound machines, mechanical power and transmission, friction, and lubrication.

#### DDT 545B Physics

2 - 0 - 2

Prerequisite TD 535B (Continuation of TD 535B Physics)

#### ACR 559D Sales and Communication 2-0-2

Communications are usually the greatest weakness of the serviceman. This course should provide the background to enable him to overcome this weakness. The student should receive instruction in customer relations, human relations, business correspondence, reporting on service diagnosis and service work, group discussions, and sales procedure.

#### ACR 579E Personal and Management Records

3-0-3

The records that a serviceman needs to keep both for himself and his employer are the basis of this course. They include time and material records, service call diagnosis and repair records, standard time and material estimates for service jobs, accident records, insurance records, and personal records, insurance records, and personal tax records. Parts lists, withdrawal slips, personal inventory record, and parts and material orders are also studied.

#### ACR 589C Management Procedures 3-0-3

This course is designed for those who will enter management or plan to establish their own business. Among the topics that will be taken up are small problems of small business, basic business law, business forms and records, financial problems, ordering and inventory, and employer-employee relations ployee relations.

#### ACR 159D Sales and Communication 2-0-2

Communications are usually the greatest eakness of the serviceman. This course weakness of the serviceman. This should provide the background to enable him to overcome this weakness. The student should receive instruction in customer relations, human relations, business correspondence, reporting on service diagnosis and service work, group discussions, and sales procedure.

#### ACR 179E Personal and Management Records

The records that a serviceman needs to keep both for himself and his employer are the basis of this course. They include time and material records, service call diagnosis and repair records, standard time and material estimates for service jobs, accident records, insurance records, and personal tax records. Parts lists, withdrawal slips, inventory records, and parts and manual slips. Inventory records, and parts and manual slips. slips, inventory records, and parts and material orders are also studied.

3-0-3

#### ACR 189C Management Procedures 3-0-3

This course is designed for those who will enter management or plan to establish their own business. Among the topics that will be taken up are problems of small business, basic business forms and records, financial problems, ordering and inventory, and emproblems. problems, ordering and inventory, and employer-employee relations.

#### D 159B Business Organization

This course will include the basic economic factors involved in daily business operations. Factors which will be considered are business, budgeting, the effects of business competition, overhead costs, salary scales, and profit and loss.

#### ET 5195 Social Science 2-0-2

Brief introduction to the four basic sosial sciences; Psychology, sociology, nomics, and government.

#### ET 529S Social Science 2-0-2

Prerequisite ET 519S (Continuation of ET 519S Social Sciennce)

#### MS 169B Human Relations

A study of principles of psychology that will be of assistance in the understanding of inter-personal relations on the job. Motivation, feelings and emotions, and Motivation, feelings and emotions, and learning are considered with particular reference to their application to do on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflict as they relat eto the employee and his work satisfaction. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.

#### MS 189C Industrial Organization and Management 3-0-3

This course includes the basic economic factors involved in daily business operations of a machine shop. Factors which will be considered are buggeting, the effects of competition every basely. competition, overhead costs, salary scales, and profit and loss.

#### MS 189E Specifications 2-0-2

A course developed to inform the trainee of the "what" and "why" of specifications, machine tool and hand tool specifications as well as job and procedure sheets will be studied and organized. Catalogs, specification sheets and manufacture's hand-books will serve as reference sources.

#### RTV 169 Business Management

This cours will be a study of basic economic factors involved in operating a Radio and T. V. repair shop. Such matters as budgeting, business competition, advertising, overhead costs, service charges, ary scales, and profit and loss will

#### RTV 179B Human Relations

A study of principals of psychology that will be of asistance in the understanding of inter-personal relations on the ejob. Motivation, feelings and emotions, and learning are considered with particular reference to their application to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts as they relate to the employee and his work satisfaction. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a hygiene to his adjustment problems as a worker and a member of the general community.

#### **DDT 559 Business Organization** 1-0-1

This course will include the basic economic factors involved in daily business operations. Factors which will be considered are business, budgeting, the effects of business competition, overhead costs, stlary scales, and profit and loss.

#### DDT 589A Industrial Human 1-0-1 Relations

A tudy of principles of psychology that will be of assistance in the understanding of inter-personal relations on hte job. Motivation, feelings and emotions, and learning are considered with particular reference to their application to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflict as they relate to the employee and his work satisfaction. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general comworker and a member of the general community.

## FIREMANSHIP TRAINING

The major objective of the Firemanship Training program is to provide instruction, geared to local needs, which will increase the skill and knowledge of the fire fighter in firematic subjects. Instruction is given helping the firemen to keep abreast of technological and economic changes of the fire profession and to assist him to qualify for advancement in the fire protection field. The curriculum includes technical and manipulative instruction as well as safety and supervisory development. The program is composed of two phases. These phases along with major points of interest are as follows:

# Fire Service Methodis and Techniques

Basic Unit 1 — 15 hours.

- a. Five major causes of failure
- b. Protective Clothing
- c. Breathing Equipment

Basic Unit 2 — 15 hours.

- a. Forcible Entry
- b. Ventilation
- c. Salvage and Overhaul
- d. Handling Ladders

Basic Unit 3 — 15 hours.

- a. Structural Fire Fighting Procedures
- b. Chemistry of Fire
- c. Portable Fire Extinguishers
- d. Fire Hose Practices

# **Pump Operations**

Basic Unit 4 — 15 hours.

- a. Mechanical Principles of Fire Pump
- b. Fire Steam Practices

Fire Service Methods and Techniques — 368 hours.

- 1. Forcible Entry, Rope and Portable Extinguisher Practice
- 2. Ladder Practices

- 3. Hose Practices
- 6. Fire Apparatus Practices
- 7. Ventilation Practices
- 8. Rescue Practices
- 9. First Aid Practices
- 4. Salvage and Overhaul Practices
- 5. Fire Stream Practices
- 10. Fire Inspection Practices

# Fire Service Officer Training—50 hours.

- 1. The Fire Department Officer
  - a. Organization and the Fire Officer
  - b. Non-Fire Fighting Activities of the Fire Officer
  - c. Fire Fighting Activities of the Fire Officer
- 2. Fire Service Instructor Training
- 3. Fire Fighting Procedures

# SUPERVISORY DEVELOPMENT TRAINING PROGRAM

The Center conducts an evening school program to meet the educational requirements of men an dwomen who desire to prepare themselves to fill the growing need of industry for personnel with technical and supervisory training.

Information concerning the admission requirements, cost, diploma requireemnts, and certificate requireemnts may be obtained by visiting or calling the Center during school hours.

The courses are offered when as many as 10 or 12 people request the same course. A diploma is offered when 8 required and 8 elective courses are taken from the list below. An advanced diploma is given for 8 additional required subjects and 8 additional elective subjects. The courses by category are listed below:

# Category I—Basic Human Behavior and Behavorial Sciences

- Course # 1. Art of Motivating People
  - 2. Motivation and Resistance to Change
  - 3. Problems of Handling People
  - 4. Economics Training
  - 5. Applied Psychology

# Category II—Organization and Management

- Course # 6. Principles of Organization and Management
  - 7. Problems in Business Management I
  - 8. Problems in Business Management II
  - 9. Effective Job Organization
  - 10. j-i-f-f-i-e
  - 11. Training Courses in Cost Accounting
  - 12. Cost Control Accounting
  - 13. Machinery Manufacturing Cost Control

# Category III—Supervision

- Course # 14. Oral Communication
  - 15. Handling Barriers in Communications
  - 16. Communications in Business and Industry
  - 17. Labor Laws for Supervisors
  - 18. Departmental Personnel Procedures
  - 19. Foremanship Training

# Category IV—Work

# Course # 20. Job Analysis Training

- 21. Personnel Management—Job Analysis
- 22. Personnel Management—Job Evaluation
- 23. Production Scheduling and Control
- 24. Wage Incentives
- 25. Quality Control
- 26. Job Methods Training
- 27. Time and Motion
- 28. Work Simplification
- 29. Paperwork Simplification

# Category V—Employee Utilization

# Course # 30. Problem Solving

- 31. Program Development
- 32. Waste Reduction
- 33. Job Relations Training
- 34. A Suggestion System
- 35. Conference Leadership Training

# Category VI—Employee Development

# Course # 36. Techniques that Produce Teamwork

- 37. Material Handling
- 38. Job Instruction Training
- 39. Using Job Instruction Training

# Category VII—Academic Development

# Course # 40. Techniques of Clear Writing

- 41. Business Letter Writing
- 42. Technical Report Writing
- 43. Memo and Report Writing
- 44. Vocabulary for Supervisors
- 45. Slide Rule I
- 46. Slide Rule II
- 47. Industrial Speed Reading
- 48. Advanced Speed Reading
- 49. Effective Speaking for Supervisors
- 50. Extemporaneous Speaking for Industrial Supervisors
- 51. Creative Thinking I
- 52. Creative Thinking II
- 53. Creative Thinking III

# Catagory VIII—Work Safety First Aid, Health Education, Housekeeping and Maintenance

Course # 54. Industrial Safety I

- 55. Industrial Safety II
- 56. Industrial Safety III
- 57. Industrial Safety IV
- 58. Industrial Safety V
- 59. Industrial Safety VI
- 60. Accident Prevention for Industrial Supervisors
- 61. First Aid Instruction
- 62. Plant Maintenance and Housekeeping

## **EVENING SCHOOL PROGRAM**

The Center conducts an Evening School Program to meet the educational requirements of men and women who desire to update or upgrade themselves to fill the growing need of industry for such people.

In order to be eligible to take one or more of the courses listed below, a person must be employed in the occupational field in which the course is given. These courses are available to industrial organizations, apprentice groups, and to individuals when there is suffifient number of students to begin a class. A class may be started if there are as many as twelve interested people who desire to take a particular course.

The cost and other requirements are the same as shown in the general information section of the catalogue.

Additional information concerning this Program may be obtained from the Director, the Associate Director, or Assistant Director by visiting or calling the Catawba County Industrial Education Center. Partial list of courses are listed below:

Basic Electricity

Blueprint Reading

Sheet Metal Related Theory

Radio and T.V. Related Theory

Color Television Related Theory

Machinist

Engine Overhaul

Brakes

Transmissions and Clutches

Electrical System (Auto Mechanics)

Front end alignments

Bench Work and Layout—The Machine Shop

Drill

Lathe

Milling Machine

Grinder

Report Writing

Loom Fixing

Knitter Fixing

Electrical Code

Slide Rule

Tool and Die Theory

Related Mathematics

# **FACULTY:**

Agriculture Technology	
Air Conditioning & Refrigeration	Pending
Automotive Mechanics	Joe Amos, Department Head Henry Mackie
Bricklaying	
Drafting & Design Technology	
	Philippe Gilissen William Coley
Electronics Technology	Clayton Groves, Department Head Ralph Tilson
	William Hirshberg
Knitter Fixing	William Hollar, Department Head Ray Teague
Loom Fixing	
Machine Shop	
Mathematics	
Physics	
Technical Writing & Related Subjects	
Upholstery—Cutting & Sewing	
	Mrs. Pauline Coble
SUPPLEMENTAL FACULTY:	
Tony Dincalci	
Garlan Eaker	Blueprint Reading
Terrance Hebert	
Edwin Isenhour	
James Nowell	
Thurman Taylor	
Grady Watts	
Clarence Mason	
George Kimberlin	
Alvin Lowdermilk	-
Claud Hefner	
Vernon Deitz	
Jake Schoonderwoerd	
Johnny Hefner	
Robert Holland	- · · · · · · · · · · · · · · · · · · ·
Charles Cagle	- · · · · · · · · · · · · · · · · · · ·
Robert Grigg	_
Paul Moretz	_ · · · · · · · · · · · · · · · · · · ·
Robert Shores	
Martin Burrows	
OFFICE STAFF:	
Mrs. Virginia Deal	Secretary & Receptionist
Mrs. Judy Rogers	
Mrs. Caroline Ledford	-
George Brown	
Tommy Ramseur	



